

SPECIAL ECONOMIC DEVELOPMENT (SUSTAINABILITY / AGRICULTURE /  
FOOD / ENERGY) & INTERGOVERNMENTAL RELATIONS  
COMMITTEE MEETING  
WATER WORKSHOP

NOVEMBER 10, 2014

The Special Economic Development (Sustainability / Agriculture / Food / Energy) & Intergovernmental Relations Committee Meeting, Water Workshop, of the Council of the County of Kaua'i was called to order by Mason K. Chock, Sr., Vice Chair, at the Council Chambers, 4396 Rice Street, Suite 201, Lihu'e, Kaua'i, on Monday, November 10, 2014 at 1:06 p.m., after which the following members answered the call of the roll:

Honorable Mason K. Chock, Sr.  
Honorable Gary L. Hooser  
Honorable JoAnn A. Yukimura  
Honorable Tim Bynum, an Ex-Officio Member  
Honorable Jay Furfaro, an Ex-Officio Member

Excused: Honorable Ross Kagawa  
Honorable Mel Rapozo

APPROVAL OF AGENDA.

Councilmember Hooser moved for approval of the agenda as circulated, seconded by Councilmember Yukimura, and carried by a vote of 3:0:2 (*Councilmember Kagawa and Councilmember Rapozo were excused*).

PUBLIC COMMENT.

Pursuant to Council Rule 13(e), members of the public shall be allowed a total of eighteen (18) minutes on a first come, first served basis to speak on any agenda item. Each speaker shall be limited to three (3) minutes at the discretion of the Chair to discuss the agenda item and shall not be allowed additional time to speak during the meeting. This rule is designed to accommodate those who cannot be present throughout the meeting to speak when the agenda items are heard. After the conclusion of the eighteen (18) minutes, other members of the public shall be allowed to speak pursuant to Council Rule 12(e).

There being no one to give public comment at this time, the meeting proceeded as follows:

WATER WORKSHOP:

The Kaua'i County Council's Economic Development (Sustainability / Agriculture / Food / Energy) & Intergovernmental Relations Committee will conduct a second workshop to provide an opportunity for additional and/or clarifying information to be presented relating to the presentations made during the October 9, 2014 Water Workshop. This is a non-decision making, informational workshop to discuss water issues in Kaua'i's Puna District which have been raised by the community group Hui

Ho'opulapula Na Wai o Puna ("Hui"). The Workshop is being held so that the Committee can become better informed and the community engaged in broader issues and process.

Representatives from the United States Geological Survey (USGS) will make a presentation regarding water resource information available from the USGS.

Professor D. Kapua'ala Sproat, with Ka Huli Ao Center for Excellence in Native Hawaiian Law and the Environmental Law Program at the University of Hawai'i at Mānoa, William S. Richardson School of Law, will be available to answer any questions raised by the USGS' presentation or related to her clinic's October 9, 2014 Water Workshop presentation.

The Office of Hawaiian Affairs has provided funding to Professor Sproat's Environmental Law Clinic this fall to assist the Hui and the County of Kaua'i in better understanding this issue.

Dr. Adam Asquith, from the University of Hawai'i at Mānoa Sea Grant program, will also be available to answer any questions raised by the USGS' presentation or related to his October 9, 2014 Water Workshop presentation.

This Workshop will provide time for open facilitated questions and discussion focused on information presented, process questions, and process options.

Councilmember Chock: I think what we were planning on doing this afternoon is to follow right in line with...for the most part we have had introductions. We have the pleasure of also having our Department of Water present today. I know they had a busy day scheduled today but are here to join us. Again, just as a reminder, this is a continuation of a workshop we held on October 9, 2014 and I want to thank Professor Sproat and also Dr. Asquith for their presentations and for the opportunity to continue to have this discussion with other stakeholders present today. With that, I would like to call up the USGS representatives and we will have you do your presentation first. I know that we do not have hard copies of the presentation yet, I know we just received the presentation. If you do want one, please let us know.

STEPHEN ANTHONY, Center Director, USGS Pacific Islands Water Science Center Programs on Kaua'i: I am the Director of the United States Geological Survey Pacific Islands Water Science Center. I would like to thank you for the opportunity to present to you today, an overview of some of our programs that we have conducted here on the Island of Kaua'i. For those that are not familiar with the USGS, I represent one (1) entity of USGS in Hawai'i. There are other groups represented in Hawai'i by USGS, which includes the Hawai'i Volcano Observatory on the Big Island as well as the Pacific Island Ecosystem Research Center which houses most of its employees also on the Big Island, but it is centered out of Honolulu. Some of you may also be aware of Dr. Theirry Work who works with the USGS National Wildlife Health Center and Theirry works out of Honolulu. But again I am here representing the Water Science Center of USGS.

Our mission at USGS is primarily as a Science Agency. We are not regulatory. Our mission is to provide information to help others manage, protect, and enhance water resources. We provide information on both sides of issues related to water resources whether...again those that are interested in protecting, preserving water resources, as well as those that need to develop water resources to serve both our

agricultural and public supply needs. We also address water-related hazards such as flooding and again we do not have a regulatory role. Those responsibilities primarily related to water lay with the State Water Commission when it comes to water quantity and our State Department of Health as it relates to water quality. As part of our mission, we strive to provide actionable information that is both reliable, impartial, and timely, with respect to water issues.

Our Center has a number of core science capabilities. First and foremost is our Hydrologic Data Collection programs. We collect information on climate and rainfall. For example, we run quite a network of stream gauges in the State as well as looking at suspended sediment loading in our streams. We monitor ground water, particularly ground water levels and salinity, which is important for our drinking water aquifers. We also collect information of water quality both in groundwater and surface water. As I mentioned, we have other components to our programs such as our research and assessments. Scot Izuka who will be speaking after me is part of our research group and in that group we have core capabilities, in particular, related to ground water flow in solute transport modeling, one (1) of Scott's areas of expertise. We also do hydraulic modeling, streams, and watershed modeling. Finally, our third capability relates to providing information to others particularly with our rainfall and stream gauge networks. We operate flood alert systems. I know that the community in Hanalei relies heavily on that with respect to whether or not to be closing the bridge in the Hanalei area. We also have a database on the internet called Endless Web where all of information that we have collected over the last hundred years is available to the public, again, rainfall information, ground water information, stream flow, and water quality. We produce many publications and provide presentations, and all of that information is available on the internet.

There are a number of water related issues that we focus our science on; the first is groundwater availability. Groundwater provides much of the drinking water supply in our State and has resulted as a very high priority in our research. The second is looking at the quantity and variability of stream flow. This is both low flow in the stream that is needed to support Native aquatic communities as well as agriculture, Native Hawaiian gathering rights, et cetera, as well as looking at high flows as there are great concern of flooding in many communities. Most of you know that our streams rise very rapidly in response to rainfall of that sort. The third issue that we focus on is water quality related to land use, in particular land use changes. As our large scaled sugar plantations and other agricultural activities have waned in the State. We are seeing changes in the types and amounts of nutrients and pesticides applied to the land and so it is important to take a look at that and understand how that is affecting our ecosystems. Then finally, we look at climate variability and change. Climate is changing. We go through droughts, perhaps long-term changes in climate due to global climate change. So we are collecting information on that and particularly useful is our stream gauge network. We have gauges who have been operating for over a hundred (100) years now and we have been able to detect changes in our base flow and streams over time.

Over the years we have conducted a number of water resource investigations on Kaua'i. One thing that is unique about our Agency is that we do not receive a large appropriation from Congress to conduct research on our own. Much of the work that we do relating to water resources in Hawai'i is conducted in cooperation with State and local agencies. Here on this island, the State Water Commission funds many stream gauges and rain gauges and then over the years we had a very close relationship with the Kaua'i Department of Water, where in the 80s and 90s we

operated an explorer trade drilling program and we did a lot of testing of the aquifers looking at the permeability of the aquifer and the overall groundwater availability. We have done some numerical groundwater modeling looking at groundwater resources in particular its relationship to stream flow and Scott Izuka will be talking about some of the work that he had been conducting in that area. Then more recently we completed a project in cooperation with the Department of Hawaiian Home Lands (DHHL) looking at the low flow characteristics in the Anahola Stream. Again, looking at how much water is available during low flow conditions for both agriculture and supporting the ecosystem.

This is a map showing the stream gauge, rainfall, and groundwater monitoring sites that we are currently operating on Kaua'i. There are about...what do we have about six (6) rain gauges that were operating. Six (6) continuous records stream flow gauges, and there are fourteen (14) wells that we collect data from. Two (2) of those wells are supported by the State Commission on Water Resource Management. The others are all supported by the Kaua'i Department of Water Supply. I will mention again that long-term monitoring is very important. We work very closely with the State Water Commission in trying to decide where best to monitor both rainfall and stream flow, and groundwater, and also with the Kaua'i Water Department trying to make sure their needs in understanding the groundwater resources that are important to their public supply system are met. Long-term monitoring is important over the years. We have seen a decline in the number of stream gauges that we have operated and we are working very hard with our cooperators to try to maintain the sites that we currently have. Almost all the sites that you see up there are related to stream flow, our gauges have been operated for a long time and we look to try to keep them funded going forward.

This slide lists several of the current water resource programs that we have on Kaua'i. As I mentioned the water resource monitoring is in cooperation with the Water Commission and the Water Department here. We also have a project, one of the few projects that we have Federal funding from USGS, that looks at groundwater recharge and does some modeling to better understand groundwater availability. This is a four (4) year project that actually Scot is the Project Chief for. This project includes the island of Kaua'i as well as O'ahu, Maui, and the Big Island. In December of this year or perhaps January, we will be doing some ditch flow monitoring training which is funded through the State Water Commission. Their desire here is to try to help those who are running agricultural ditch systems in the islands, to improve the water use reporting that the users could provide to the Water Commission, so that they could better understand how much water is being used and where.

The last item I would like to point out is a study that we have been asked to prepare a proposal for by the State Water Commission to look at the National stream flow availability during low flow conditions in southeast Hawai'i. The study area would be from the Wailua River in the North to Hanapēpē in the South. This would likely be a four (4) year study and the real goals of this study are to be able to quantify the amount of water in the streams during low flow conditions as well as to understand the effects of surface water diversions on those flow characteristics. To essentially have our crews walk the length of those streams to define areas where the streams are gaining water from groundwater or where the streams are losing water to groundwater. This information will help the Water Commission as it thinks about in-stream flow standards. There are in-stream flow standards that currently exist for all streams for Hawai'i, however those were essentially status quo, shortly after the Water Code was passed. Of course there have been many changes in our stream

system since then as many of the agricultural diversion systems have fallen into disrepair in some areas or they are actively being used in others. So this study would essentially provide a sort of, "What is the status of our streams in southeast Hawai'i with respect to, again, the low flow characteristics and what are the diversions." With that, I guess I will open it up to questions that you may have.

Councilmember Bynum: Will Scot make a presentation?

Mr. Anthony: Yes, Scot will present a much more lengthy presentation. I just wanted to provide you an overview of who we are and what are some of the things that we have done in the past and those sort of things that are coming up in the future.

Councilmember Bynum: I have questions about the upcoming, that you just showed on the last slide, first is the ditch flow thing and there was a question mark.

Mr. Anthony: Yes, the question mark is relating to when that will actually occur. It may occur in December or January, we are still working with the Water Commission to pick a location for where to hold that training. We have done the training on O'ahu. I believe the Big Island is next week or the week after and then Kaua'i or Maui is up next.

Councilmember Bynum: So it is just a timing question, not whether there is funding or not?

Mr. Anthony: The funding has been appropriated for that, so it will happen.

Councilmember Bynum: Great. And the other one; natural stream flow and diversion, that is a proposal from CWRM?

Mr. Anthony: That is a proposal that the Water Commission has asked us to prepare for them. They have told me that they have set aside some funds for it so I am quite confident that it will get started perhaps some time in 2015, perhaps in the spring. We had a preliminary meeting with Grove Farm regarding this study and they have indicated that they are very supportive and the stage that we are at now is trying to get some more information from them on where their active diversions are so that we can better provide a cost estimate of how much it is going to take to do the work. They have indicated that they are very supportive and they are a very large landowner in the area so it is very helpful that they have agreed to help with this.

Councilmember Bynum: It seems to me that we are very fortunate to have the history of the studies that you and the Water Department have collaborated with that I know Scot will be presenting. But this study is like the next logical step in terms of determining the impact on streams and to move forward in a goal of having streams eventually maintained year round for flow or...

Mr. Anthony: Yes. This is very, I would say an important study because as I mentioned earlier we conducted a fair amount of studies looking at the groundwater resources on the island.

Councilmember Bynum: Right.

Mr. Anthony: Scot will be explaining this in his presentation, but there is interaction between groundwater and surface water. I think people started to appreciate that and understand the importance of thinking holistically about our water resources both groundwater and surface water and you really cannot manage them separately at least within the Līhu'e basin and Scot will help illustrate that.

Councilmember Bynum: That will lead to my final question for now and thank you very much. Oh, I will save it for later, thank you.

Mr. Anthony: Sure.

Councilmember Chock: Councilmember Yukimura.

Councilmember Yukimura: I have specific questions so I think I would be better off waiting for Mr. Izuka's report first.

Councilmember Chock; We should continue with Mr. Izuka.

SCOT IZUKA, Hydrologist, United States Geological Survey (USGS): My name is Scot Izuka. I am a Hydrologist with the USGS in Honolulu. I have done a number of studies in cooperation with the Kaua'i Water Department between 1990 and 2005. These studies were almost ten (10) years ago, but I would like to talk today about groundwater occurrence and availability on Kaua'i, specifically in the Līhu'e basin. I will start with some general groundwater concepts and then segway into more specifics about the Līhu'e area. I would actually like to start with some take-home messages. The first is that any amount of groundwater withdrawal has consequences whether you pump ten million (10,000,000) gallons per day or one million (1,000,000) gallons per day. It is going to have some kind of consequences. These consequences and their magnitude of the consequences depend on how much water is withdrawn and on the geological setting. Availability of groundwater depends on what consequences are deemed acceptable by the community or in our case; the case of the State of Hawai'i would be the State Water Commission. Of course then that means knowing the consequences is key to knowing what the availability is. Those are some very simple take-home messages.

Going way back now to Geology. The Hawaiian Islands are made up of shield volcanos. These shield volcanos are composed of thousands of thousands of very thin lava flows. These lava flows as a pile has very high permeability meaning that water moves through it very easily. The lava flows are fed by dikes. The lava flows are erupted from the (inaudible) eruptions along rift zones and these eruptions are fed by dikes. Dikes are (inaudible) through which magma rises to the surface. After the shield building stage, the islands is pretty much expended, then streams erode the shield volcano. The magma that is still in the dikes congeals to form these very dense, low permeability sheets of rock also known as dikes. Sediments that are shed off of the island are deposited along the coast to form a coastal plain. This coastal plain tends to be really permeable compared to the lava flows that composed the island and on some islands including Kaua'i, especially Kaua'i rejuvenation stage lava flows...rejuvenated stage eruptions occur after the erosion of the island and fill the depressions left by stream erosion of the valleys and so forth with younger lava flows. These lava flows also tend to have very low permeability compared to the lava flows

that make up the rest of the island. All of the fresh water on the island ultimately comes from precipitation. Some of that precipitation runs off the island via streams, some of that precipitation evaporates or is transpire by plants, and then some of that water infiltrates the ground and becomes part of the groundwater. The groundwater in oceanic islands forms a freshwater body that is lens shape and we refer to this as a "freshwater lens." This freshwater lens sits on top of saltwater that is permeated from the ocean and there is a transition zone, brackish water between the freshwater lens, and the saltwater. In some places where the dikes have intruded the lava flows, these dikes form low permeability barriers that resist the flow of water and allow groundwater to accumulate to high elevations.

All of the water flows through the pores in the rock and this is a photograph of a cliff on the Big Island that has an exposure cross section through a pile of lava flows. There are *pāhoehoe* lava flows at the bottom and *ʻāʻā* lava flows on top. You can see that this formation has pores between the lava flows, there are pores caused by fractures. There are pores within the lava flows. There are pores in the rubble areas in the *ʻāʻā* lava flows and all of this porosity contributes to the permeability of the aquifer. The groundwater flows in these aquifers. It flows in the areas of recharge to the areas of discharge and most of the discharge occurs near the coast. When the groundwater discharges above sea level, it contributes to stream base flow. Groundwater discharged to streams is commonly referred as to base flow. When the discharge is below sea level, it is called submarine groundwater discharge and the thickness of this freshwater lens depends on a couple of things. One is, how much water flowing through the aquifers. So if there is a lot of water trying to flow through the aquifer then the freshwater lens will get thick. The other thing is the permeability of the aquifer. If the aquifer has low permeability, it will tend to resist the flow of groundwater and the freshwater lens will also become thick just like traffic on the freeway. Prior to groundwater development, in the natural condition, freshwater lens is a state of balance where the inflow from groundwater recharge is equal to the inflow/outflow from natural groundwater discharge to base flow to streams and to submarine ground discharge. When you introduce a pumping well to this system, it upsets this equilibrium and what happens is the top of the freshwater lens gets drawn down. This is the water table that gets drawn down. The amount of the draw down depends on how much you pump. The harder you pump, the greater the draw down will be. The draw down also depends on the permeability of the rock. So the less permeable the rock, the greater the draw down will be. Another thing that happens is salt water and brackish water will rise. The freshwater lens is actually...under these conditions is shrinking from the top and from the bottom. This could present problems or affect existing wells...if an existing well is fairly shallow then draw down could lower the water level in that well. If the well is deep and it is close to the transition zone then it could cause saltwater to potentially affect the water quality of that well. Eventually, as long as you do not pump too much water out of the fresh water lens, then eventually a new equilibrium will be established where inflow from recharge is equal to outflow. But in this case the outflow is natural groundwater discharge to streams and to the ocean, but also due to the pumping from the well.

For Kauaʻi, we estimate that the amount of recharge the island is getting is about eight hundred eighty-three million (883,000,000) gallons per day. Pumping totals about nineteen million (19,000,000) gallons per day and I think the County accounts for maybe about eleven million (11,000,000) or twelve million (12,000,000) per day of that. If you look at this number anyway, just the nineteen million (19,000,000) gallons per day compared to the eight hundred eighty-three million

(883,000,000) gallons per day, that is only about two percent (2%) of the groundwater recharge, a relatively small amount to water is being pumped relative to the recharge. By comparison, Honolulu pumps about ten percent (10%) of its groundwater recharge. So what is the difference? Why is Honolulu able to do that and not Kaua'i? The difference is geology. Most of Honolulu's major aquifers are in the highly permeable lava flows and Honolulu also has surrounding the island an extensive coastal plain and again the coastal plain is made out of sediments that have relatively low permeability. The combination are low permeability with what some Geologist refer to as "caprock" retorting the water flow discharge from the freshwater lens allows the freshwater lens to become very thick. So you got kind of the best of both worlds here – you have a highly permeable aquifer, so you will not have big drawdowns if you pump from this aquifer but because of the caprock, the caprock allows the freshwater lens to become thick and so you have less chance of contamination from saltwater intrusion.

Well, the USGS in cooperation with the Kaua'i Department of Water started a number of studies back in the 1990s to assess the groundwater hydrology in particular the southern part of the Līhu'e basin. It was very quickly known that the geology of Kaua'i does not lend itself to the management concepts that have been used for groundwater in Honolulu. On Kaua'i, all of this blue color here corresponds to this rejuvenated volcanics, that if you recall in my earlier slide this has very low permeability compared to the rest of the shield volcano lava flows. Because of that, most of the aquifers in the Līhu'e area have very low permeability. Because of this low permeability, the freshwater lens becomes very thick, again, it is just water backing up and it causes the water table to reach almost to the land surface. This is a block diagram that helps illustrate what is going on in the Līhu'e area. This is Kilohana crater and this is the eroded surface of the old shield volcano. This is the low permeability rejuvenated stage volcanics and it has low permeability. Groundwater is saturated almost to the groundwater but where streams in sizing the ground, it causes...well the streams in sizing the ground surface and into the water table drain the water table and allow it to (inaudible) just below the land surface. So, if it was not for these streams then the saturation would probably go all the way to the surface. Well, that means that a lot of the water that is flowing through the freshwater lens discharges to streams rather than to the ocean which is in contrast to O'ahu where much of it discharges to the ocean. When you pump from a system like this then one of the effects is that pumping is going to affect stream flow. There is not as much concern for saltwater rise because freshwater lens is so thick. Another effect because the aquifer has such low permeability is that the drawdowns are going to tend to be higher in Līhu'e.

The question is then, what is this pumping effect then? How can we address that? One of the studies we did again, in cooperation with the Kaua'i Department of Water, was to do a numerical groundwater model, which is a computer based model that stimulates groundwater flow in the Līhu'e region. One of the things we tested was – what would happen if we pumped an additional one point two million (1,200,000) gallons per day from the Līhu'e basin for four (4) wells that are indicated in red here. Our model simulation indicated that of the one point two million (1,200,000) gallons per day that would cause stream...groundwater discharge to the streams to be depleted by about one point one million (1,100,000) gallons per day and you can see that number is pretty close to the one point two million (1,200,000) gallons per day. That indicates that most of the effect of pumping an additional one point two million (1,200,000) gallons per day would be felt by diminishing stream flow. The question then arises, how significant is this? Well the significance depends on what

the stream flow is before you start pumping. In this table, this column shows the stream base flow before pumping and this is the change in base flow as a result of pumping and you can just compute the percentage. For the Wailua River in this scenario, it was a really small change – less than one percent (1%). The Hanamā‘ulu Stream was a change of 0.6 MGD but because Hanamā‘ulu Stream has a smaller amount of flow then its impact is bigger, which was fifteen percent (15%). Nāwiliwili Stream only declined by 0.2 MGD, but because it has such a small flow it constitutes a bigger the percentage of that flow. How much is it going to impact streams depends on how much water is in the stream to begin with. It also depends on how close the wells are to the streams. The closer the wells are to the streams, the bigger impact will be. So, another question might be – what could you do? Could you rearrange the pumping to minimize the impact to the smaller streams and maybe put some of the burden to the larger streams? That is the subject of this slide. One of the great things you can do with these numerical groundwater models is, you can try all kinds of scenarios and so we just added...we tested the scenario where we added three (3) more wells and closer to Hanamā‘ulu Stream, one of the bigger streams on this list, and divided it all the 1.2 MGD, same amount of total flow but divided amongst seven (7) wells. This is what the percentages were from the previous slide for the four (4) well scenario and this is what the percentages are for the seven (7) well scenario. In this case, Wailua River did not change that much because we did not put the wells that close to that big source but we put it closer to the Hanamā‘ulu Stream. You can see it came down by one percent (1%) or so. By moving some of that stress from Nāwiliwili Stream which is a smaller stream, we reduced it by four percent (4%). Again, it illustrates that you can test things out and move wells around to see if we can minimize the impact to streams. Well so far we have only talked about the effects of pumping but there are other factors that are affected, from water resources and some of these are manmade and some are not – climate variability is one of those things that you get which is what Mother Nature provides for you, but climate variability include things like droughts and wet periods. Climate change such as change in climate due to increase in greenhouse gases and so forth, that could also change our groundwater resources by affecting the amount of precipitation that we get. Another thing that is very much manmade is irrigation. Irrigation by taking water from a stream and applying it on to a field for irrigation, what you essentially are doing is taking water that normally would flow directly to the ocean and reapplying it to the groundwater system because then...just like precipitation infiltrates the ground it has a potential to increase groundwater recharge. As you know Sugar Plantations for almost a century diverted billion of gallons of water from streams to irrigate fields. The Sugar Plantation started closing in the late 20<sup>th</sup> Century and Līhu‘e Plantation, in particular, closed in 2000. So that presents the large decrease in the water that is being applied to the ground surface. One of the questions you might want to ask is what will be these effects? Again, part of the studies we have done with the Kaua‘i Water Department, we addressed that with a study and the following slides will be a summary of that. These two (2) maps show the Līhu‘e basin. That is Nāwiliwili Harbor there. This is the Līhu‘e basin under two (2) conditions. On the left is the condition under irrigated conditions when irrigation was pretty close to its peak. The color codes go – the cooler colors are higher recharged and the warmer colors are lower recharged. You can see that recharge is higher in the rainier areas which I would expect and the lower in the dryer areas in coast. But then in the dryer areas, recharge is also enhanced by these sugar cane fields that existed back when this scenario is representing. If you compare that to the situation...with no irrigation which I guess would be closer to what exists today, you can see that there is no enhancement of irrigation in the dryer areas. The difference between these two (2) scenarios, I think, is about a twenty percent (20%) decrease in

recharge. Another thing that we investigated was the effect of a drought. In this case, this was kind of a moderate drought that is simulated and this map you have seen before, this was normal rainfall but no irrigation conditions. This map shows the recharge under drought conditions with no irrigation. You can see this red color has greatly expanded. The difference between this scenario and this scenario, I think the recharge is about sixty percent (60%) lower in this case. Droughts are temporary things so eventually it will be mitigated by a period of wetter, higher rainfall but if you think about possibility of what might happen in climate change conditions then frequency of droughts may change.

Okay, just to summarize, withdrawing groundwater always has consequences or effects and the type and magnitude of effects depend on how much water is withdrawn and on the geological setting. For Līhu'e, reduction in stream flow and declining groundwater levels are the primary consequences of withdrawing groundwater. So it is not as though Līhu'e has no groundwater resources, it actually has groundwater resources, but the consequences are different then they are for O'ahu. The different consequences have to be taken into account to determine what the availability of groundwater is. The second bullet is, the effects, or the magnitude of effects, considered acceptable by the Water Commission in what is going to limit availability. So how much stream flow are you willing to accept? How much water level decline is acceptable? And then lastly, another factor that pumping can also affect groundwater availability and we just discovered that climate change and loss of sugarcane irrigation. That is it.

Councilmember Chock: That is it? Okay, thank you so much.  
Councilmembers, any questions for this portion of the presentation, for Scot?  
Councilmember Yukimura.

Councilmember Yukimura: Thank you both for being here today. Your last statement about Līhu'e has groundwater resources, I mean, we do not lack resources but that the consequences are different. Can you explain that further?

Mr. Izuka: Because the geology of Līhu'e results in this very low permeability aquifer, the two (2) main effects from pumping are higher draw down than we would see in Honolulu, by comparison. Instead of depletion of groundwater going to the ocean, we will see depletion of groundwater distress to streams.

Councilmember Yukimura: I see.

Mr. Izuka: The two (2) considerations that potentially have a limiting factor to groundwater availability are those two (2) consequences and again it is up to the manager to decide what magnitude of those consequences would be deemed acceptable, because again any pumping is going to have consequences so what magnitude is considered acceptable. At that point, we will define what is available for groundwater availability.

Councilmember Yukimura: When you say consequences, you mean the higher draw down which leads to the distress to streams.

Mr. Izuka: Okay, yes, well – they are related. The higher draw down and diminish stream flow are two (2) consequences. They are related to

each other. Another thing is that the higher drawdowns will become (inaudible) is lower water levels in existing wells.

Councilmember Yukimura: Okay.

Mr. Anthony: To add. Lower water levels in a production well would mean higher pumping costs because you are having to lift water a greater distance and then this low permeability aquifer results in a lower yield from the well because you are not able to pull as much water out of the well as you are in a more productive high permeability aquifer.

Councilmember Yukimura: Okay. If stream level is important, you are saying we need to determine what stream level is desirable for the community. Is that what the minimum stream level that the Water Commission is supposed to set? Would that setting of it be the way for the community to express what level it wants in any stream?

Mr. Izuka: Yes, I believe that is the way the Water Commission manages the stream flow with its instream flow standard.

Mr. Anthony: Kapua Sproat could probably speak to that with respect to the setting of inflow stream standards and its interaction with communities and what role they may be able to play in that.

Councilmember Yukimura: Right and my understanding is they are supposed to... the Commission was supposed to have set instream flow standards long ago but has not yet done it for most streams?

Mr. Anthony: No, in stream flow standards have been set for all streams. They set interim instream flow standards when the Water Code was passed. Kapua knows more about this than I do but my understanding is that there are inflow stream standards out there...

Councilmember Yukimura: But they are interim.

Mr. Anthony: It was such a status quo as a particular date and time.

Councilmember Yukimura: Okay. And factored into that is also potable water needs for a community both existing and growth projected?

Mr. Izuka: Into the instream flow standard.

Councilmember Yukimura: Well, into the dynamic of how water is being used and conserved.

Mr. Anthony: I think one way to answer that question is that each County works on the water use and development plan that feeds our State Water Plan. Again, these types of questions are really best addressed by the State Water Commission but that is really my understanding of it as we are trying to assess water availability. The one piece that we look at is the water use and development plan when we say...Scot has developed a numerical groundwater model and we are going to think about what scenarios we can test in this model to look to see if a water

use and development plan...because those plans would outline what the current use is as well as what anticipated uses will be.

Councilmember Yukimura: When you talk about water, you are talking about potable water use.

Mr. Anthony: It could be any use of water.

Councilmember Yukimura: I guess the Water Department will weigh-in on that. I thought the Water Department is developing the Water Use Plan.

Mr. Anthony: I would imagine they play a role in this.

Councilmember Yukimura: Okay, so maybe we will hear from them.

Mr. Anthony: I am sure Dustin can speak to that.

Councilmember Yukimura: Okay, thank you very much.

Councilmember Chock: You spoke about the irrigation and so forth, and you spoke to it sort of a positive and negative depends on how it is utilized well. I wonder if you could distinguish that a little bit better for us.

Mr. Izuka: By taking water from the stream and putting it on to the land, if you are not concerned about the water in the stream then I guess that would be positive for groundwater resources because it enhances recharge however it is taking water from the stream. Again, to diverse myself from value judgments from science, that is not a valid judgment that we have made, it is just that we wanted our models to indicate that if you take water from the stream, you are actually putting it back into the water system because you are adding to groundwater recharge. In that sense, yes, it is positive.

Councilmember Chock: Right. So, it is really just about management of establishing those...and taking care and maintaining those ditches, but also making the decision of how it is actually utilized properly for all parties involved – all stakeholders.

Mr. Anthony: Yes, and to recognize the interconnection between when you take water from one location and use it in another; there is a connect. For example, the water we use is an issue that our State is looking at. In many locations wastewater runs through treatment plants and put into injection wells or is discharged offshore and folks were looking at where that can be used in some areas. Where irrigation and again that would have the same consequence that Scot was describing as it would then recharge the aquifer.

Councilmember Chock: Thank you.

Councilmember Hooser: Thank you. It is very interesting. Just to restate, essentially what you are saying is when we increase using more water in this particular area because of the natural geology of Kaua'i, every increase in water usage will be a decrease in stream flow? Almost one to one, I think...

Mr. Izuka: Lihue.

Councilmember Hooser: Yes.

Mr. Izuka: Līhu'e, in particular, it is probably not the case island-wide.

Councilmember Hooser: But in Līhu'e, we have a new development, we need x number of million gallons and then that would decrease the flow from the streams?

Mr. Izuka: It does not necessarily have to be that way because again, it depends on where you put the well. If you put the well closer to the ocean than to the stream then it will impact the ocean more. So it is where you put the well relative to the area of impact of concern that you have. If you put it closer to a stream then it will impact the stream more than it will impact the ocean.

Councilmember Hooser: So we can have increase water development in the Līhu'e area that will not decrease stream flow?

Mr. Izuka: Yes, but the closer you put it to the ocean, the more concern you will have for saltwater. It is less of a concern in Līhu'e than in Honolulu because the freshwater lens is so thick, but if you do put it closer to the ocean then there is potential that you can get saltwater intrusion.

Councilmember Hooser: So, would that be the answer to the problem, put all your wells closer to the ocean?

Mr. Izuka: Except for the saltwater intrusion.

Mr. Anthony: Except for the saltwater intrusion and then there are also benefits that is of freshwater that discharges to the near shore environment for other ecological purposes. The basic message is that there is no free lunch out there that you really need to understand that things are really interconnected within our environment, and it really comes down to value judgments that a community of society plays of how to best manage our needs as humans which is we need water to survive. If we are going to alter the system in some way, there are consequences, you just need to decide how best to manage within those.

Councilmember Hooser: And it seems that from your description that the Kaua'i situation there is a lot less room to maneuver, if you would, the geological environment is much more sensitive than O'ahu to stream flow, impacts, and others. Is that not what you said? I do not want to put words in...

Mr. Izuka: Yes but maybe I can...

Councilmember Hooser: I think it is important for people to realize that... people say, "Oh, there are a million people over there and they seemed to be doing okay, and we are only seventy thousand, what are we worried about," but the geology is different.

Mr. Izuka: Yes. You are right. Because the geology is different, the consequences of pumping groundwater is primarily on stream flow and less on submarine groundwater discharge. It is more like Honolulu. The other impact

is on depressing the water table, the drawdown, and that has very practical limitations for the Water Department because the drawdowns are going to be high and the well yields tend to be very low in Līhu'e. Where in Honolulu, you could drill a well and say, "Most likely I could get three hundred fifty (350) gallons per minute or something like that from it," that might not be the case for Līhu'e. You might have to drill several wells or maybe one (1) well but the drawdown will be so high that it is not practical to get that much water out of it. That is another challenge. The cost of drilling is something to consider because we will need to have more wells to reach the same capacity unit that Honolulu has because of the geology.

Councilmember Hooser: If you could address your comment on surface water. It seems like we have surface water from streams and then we have groundwater. If we stop drilling groundwater and switch to surface water collection, are the impacts...can you talk about the impacts on the streams and the impacts on the water system, in general, if surface water is used.

Mr. Anthony: Well I guess I would say that one would be this study that we will be undertaking hopefully with funding and cooperation with the State Water Commission would look at stream flow and the low flow characteristics in the stream essentially how much water is there more than fifty percent (50%) of the time. One of the things that is different about Kaua'i as opposed to some of the other islands is actually you have very significant surface water resources in relation to some of the other islands. This is the island where we have rivers rather than streams on O'ahu. There are significant surface water resources here. But like groundwater, if you develop surface water resources there are consequences associated with that which are going to reduce flows and there are native organisms that depend on the flow in the stream. There are gathering rights that Native Hawaiians have. There are benefits for the flow out to the near shore environment. It is a matter of understanding what those consequences are and trying to best quantify them and to balance those up against the values of the community and thinking about how best to manage.

Councilmember Bynum: Thank you very much for the presentation. I want to go back to one of the slides because you were...you put the well in, we got very permeated groundwater and so just from a layman's perspective you put a well in and it is going to go "gang busters" because the water is so permeated. But you are saying, no, you have decreased flow. Just from a layman's perspective to understand that, is it because this well is pulling from this area but it cannot pull far away? Explain that to me.

Mr. Izuka: Yes, maybe I better go back. The high permeability rock...the rock is high permeability in the shield and I do not want to go too much into geology, but when the island is forming and it is forming shield volcanos, it is made up of these very, very thin lava flows. Those lava flows are what have the high permeability. It is because the lava flows impart because they are so thin and they flow on this very gradual slope on the shield volcano...

Councilmember Bynum: Scot, I do not want to interrupt you but I did not pose a question. What we have in Līhu'e is low permeability saturated, right?

Mr. Izuka: Right.

Councilmember Bynum: So when you put the well in even though it is saturated, it can only pull from nearby, it cannot pull from far away? Is that why the wells are diminished?

Mr. Izuka: Yes, the immediate effect is that it is pulling water from the nearby area but the drawdown actually as time goes by, it spreads and what actually happens the connection between drawdown and the decreased stream flow is that when that drawdown finally reaches a stream that it starts taking water from that stream. So it is spreading and it will continue to spread until it gets enough water to make up for the water you are pumping from the well.

Councilmember Bynum: And then these wells in Līhu'e are less efficient and lower water is coming out, right?

Mr. Izuka: Yes, if you took it as a ratio of the amount of water that you pump versus the drawdown you have – Līhu'e has less water for the drawdown.

Councilmember Bynum: That makes our wells more expensive to run?

Mr. Izuka: That would be...

Councilmember Bynum: Because we are having to go lower or we are using more energy to pull less water, right?

Mr. Izuka: And probably have to drill more wells to get the same amount of water.

Councilmember Bynum: Right and the most significant problem, I think, we will get that with the next speakers, the questions and answers about the policy issues which raises... because here it is almost a 1:1 withdraw from the stream, right?

Mr. Izuka: Again, depending where you place your wells.

Councilmember Bynum: Right, so one (1) option would be a whole bunch of wells, right? Because each one will be less efficient, so you get a whole bunch but then it will be really expensive, is what I heard you say, right?

Mr. Izuka: Just to make one (1) more comment, I did say about how close your wells are to the streams. Līhu'e has lots of streams. It is relatively difficult to locate a well without being close to a stream.

Councilmember Bynum: And our streams, you did not mention this but, the streams in Līhu'e like Puali Stream, the head waters are not way up in the mountains, right, the head waters are at Kilohana Crater?

Mr. Izuka: Yes, they are not huge drainage basins. They are very small drainage basins.

Councilmember Bynum: Currently we take water in the Huleia and we divert it to Waita Reservoir, so will that not impact groundwater and stream flow in the Huleia?

Mr. Izuka: If you are taking surface water?

Councilmember Bynum: Taking surface water from the Huleia Stream and diverting it to Waita Reservoir, so I am thinking if it went down Huleia Stream, it would help recharge the Līhu'e basin, right? Are we not giving that stream a double whammy when we take it out of the stream and then that water is not recharging the Līhu'e area, it is going to a different *ahupua'a*.

Mr. Izuka: That is our present understanding of stream flow – the relationship between stream flow and groundwater in the Līhu'e area is that groundwater discharges to the stream rather than surface water in the stream recharging to groundwater.

Councilmember Bynum: I see.

Mr. Izuka: Now, that is based on our present understanding. Certainly some recharge probably happens in the stream and the primary between stream flow and groundwater is groundwater discharges to the stream.

Councilmember Bynum: I appreciate your presentation very much and pointing out what the policy issues are about impacts on your shore environment...but that is not your *kuleana*, right? You provide us with the information and we make the policy decisions, correct?

Mr. Anthony: That is correct; we do not make policy decisions.

Councilmember Bynum: Thank you very much.

Councilmember Chock: One of the questions that has brought us to this place was, "should Kaua'i look at being a designated water management area" and I know there is a process, which has been outlined. Based on the current proposed water resource programs forthcoming, would this help to determine an established data to make that determination?

Mr. Anthony: The information that would become available from our studies would help inform the community and those who are very interested in this topic, but it would not necessarily lead to a yes or no and if you should designate. It would just provide information that would be beneficial to those that need to make those decisions.

Councilmember Chock: Okay, thank you. Councilmember Yukimura.

Councilmember Yukimura: So it appears when Līhu'e was mainly cane fields and had open irrigation ditches that that contributed substantially to groundwater recharge, is that correct?

Mr. Izuka: Yes, that is correct.

Councilmember Yukimura: There is a certain next thought which would be, wow, we really need to keep agriculture going in this region but the agriculture best practices are not open ditches anymore, are they? They are more drip irrigation.

Mr. Izuka: Yes.

Councilmember Yukimura: So it is not necessarily so that if you have agriculture you would have this kind of recharge that we used to get when it was open ditch and there is not much of a future scenario that would lead us to open ditches, right? And the water that came from the irrigation of the plantation fields, where did that come from? I mean, they did not draw groundwater in order to irrigate the ditches, right, it came from the mountains.

Mr. Izuka: For Līhu'e, it came from stream flow.

Councilmember Yukimura: It came from stream flow...where? How high up?

Mr. Izuka: At one time the stream diversions came all the way from Hanalei and across the divide...

Councilmember Yukimura: So we were getting water from the Hanalei Watershed which...

Mr. Izuka: Not only from there...from the Wailua River too.

Councilmember Yukimura: From the Wailua River as well and all of that right now has stopped? Is it still continuing?

Mr. Anthony: That would partly be the subject of this future study that we are talking about. So, yes, that would help document the current status of the system.

Councilmember Yukimura: Because the surface water treatment plant is getting water from where?

Mr. Anthony: I think it would be best answered by the Water Department.

Councilmember Yukimura: Okay.

Councilmember Chock: Sure.

Councilmember Yukimura: My final question is – there was a proposed project to take water from the dikes and mountains up above Līhu'e, I guess, I am not really familiar with the details of the project. Would that have brought new water into Līhu'e?

Mr. Izuka: It has been very well documented in Honolulu and it is probably the case on Kaua'i that developing groundwater from these dikes compartments affects stream flow and as much as the water from those dikes fed

streams that groundwater development would have probably affected those streams as well.

Councilmember Yukimura: And did they do studies to actually establish that on O'ahu?

Mr. Izuka: Yes, it is pretty well established.

Councilmember Yukimura: And so if ever that is a prospect again, that would be the kind of study that is needed?

Mr. Izuka: Yes, you can also look at the Honolulu, O'ahu's studies as analog and anticipate that might be the consequence of developing dike and groundwater then that would compel you to look at impact to stream flow.

Councilmember Yukimura: Is there a way to actually study impact without doing the project?

Mr. Izuka: You can create a numerical groundwater model, however, a numerical groundwater model, computer model, is only as good as the data that we have available to create the model. Fortunately for us when we did the one in Līhu'e, that was actually part of a larger data gathering and we did a lot of drilling and aquifer testing in order to create the numerical groundwater model, so we have a lot of data with that. Again, that is in cooperation with the Department of Water and because that data was available that we could make that groundwater model. I do not believe that level of groundwater data is available for the areas that have dikes.

Councilmember Yukimura: Okay, thank you very much.

Councilmember Chock: Councilmember Bynum.

Councilmember Bynum: Basically, we have a dilemma in Līhu'e because of the unique geology, correct? And you suggest that some of the alternatives which one is really careful management of where wells are placed and trying to find that balance and increase the groundwater there. I think Councilmember Yukimura just said maybe that one of these (inaudible) dikes higher up that would potentially...and you are saying there may be a problem with that affecting stream flow as well. We currently are taking the base flow streams from both sides and moving it to Līhu'e, correct? Is another option...because you have distinguished the difference between base flow and flood conditions, do some communities catch surface water in big reservoirs that is not from the base flow but is from those times where there are plenty of water moving into the ocean. Would that potentially be another solution for Līhu'e?

Mr. Anthony: I would start capturing high flows as another consideration that could be looked at. I think one of the things that is important to also recognize is that...what Scot and I have been talking today about are the water resources as it relates to the geology, as it relates to how groundwater interacts with surface water, but in thinking about your way forward, there are engineering considerations that also plays a big part of whatever decisions are made with respect to developing water resources. Hydrologist and Geologist can come forth with, you know, in an ideal world this is how you might approach developing your water

resources in a way in which to have minimal impacts on stream flows or less impacts on submarine groundwater discharge, et cetera. Then you have to bring that up against landownership, engineering considerations, and the other costs associated with those. So it does become very complex in a number of factors that have to be considered and obviously the Water Department is well adverse in considering engineering aspects of developing water resources.

Councilmember Bynum: Right.

Mr. Anthony: And we leave it to them to think about those aspects of things.

Councilmember Bynum: That is a wonderful answer to show us the complexity of the issue and even if this is engineering feasible, we have not done a return on investment cost benefit analysis that has to happen.

Mr. Anthony: Right

Councilmember Bynum: I think we are safe to say that the work that you have been doing has shown us that we have a dilemma and that any fix...I mean the one you has talked about strategically placed the wells closer to the ocean has risks and have high costs involved. Resources of water higher up have risks and costs involved and now you are pointing out capturing seasonal flow has costs...

Mr. Anthony: Sure. And dam safety and the regulation associated with them, right.

Councilmember Bynum: Thank you very much.

Councilmember Chock: Thank you for the presentation. Again, what we will do is we will have the Department of Water up and have Professor Sproat folks back up and then public testimony, and then we will have a little panel discussion at the very end. I want to accomplish this all before 4:00. Can we call up Water, I know you have a testimony to share based on the last presentation.

KIM TAMAOKA, Department of Water: We are here to speak on and cover a number of points today. We would like to clarify and comment on statements that were made during the October 9, 2014 information workshop discussion on water issues.

First we would like to clarify that the Department of Water has made every attempt to be transparent and uphold our end of the public trust as it relates to the Department of Water. We agree that the geology here on Kaua'i, specifically the Puhi-Līhu'e-Hanamā'ulu area is different than the other islands across our State. The Department of Water has recognized this through various studies we have partnered in or funded, and it has led us to the decisions we have made over the past ten (10) to twenty (20) years. One example of this recognition is through our partnership with the USGS, dating back to the early 1990s. We partnered with the USGS to conduct a study on the estimation of groundwater recharge and water use, the drilling and testing of nine (9) new exploratory monitor wells, mostly in the Līhu'e basin, the amount of seepage runoff and other analyses to estimate groundwater discharge to streams, and the creation of the numerical groundwater model of southern Līhu'e basin. All of USGS reports are available to the public.

We understand the Committee's intent to become better informed and to engage the community in the broader issue of designating a water management area. Whatever may unfold, the Department of Water respects the legal process and will remain transparent through it as we continue to remain good stewards in upholding the public trust. We will also remain good stewards in upholding our mission, which is to provide safe, affordable and sufficient drinking water through wise management of our resources with excellent customer service for the people of Kaua'i.

That being said, we would like to reiterate that there is a process that must be followed when seeking to designate a water management area. The Department of Water is just another entity within the process, overseen by the Commission of Water Resource Management (CWRM). So it is not our plan to comment on specifics within the designation process until a further time when the DOW must be involved. However, in the effort to these Council/Committee Workshops to educate and give a full picture to the public, it is fair to mention that should designation occur, there would be a major impact to all end users. There will be legal fees, more permitting, on increase in time to design and construct, and it will ultimately impact everyone using water, from large to small entities.

When presenting on an issue with such significant impact, there should be factual quantitative and qualitative data relative to current situations.

There are a number of inaccuracies to Mr. Adam Asquith's presentation on October 9, 2014. Stated below are DOW's clarifications to Mr. Asquith's slides and statements made at that workshop.

Councilmember Yukimura: I just want to clarify that the Water representatives are resource people so they are not bound by the three (3) minute time limit.

Councilmember Chock: You got more than three (3) minutes, Dustin, so do not worry about it.

Councilmember Yukimura: Just a clarification. Thank you.

Councilmember Chock: Continue.

DUSTIN MOISES, Waterworks Project Manager: I will be as quick as I can, I need to pick up my daughters from pre-school. You know first of all, I appreciate the opportunity for the Department of Water to come and give our testimony today. We come in peace and we come to basically clarify some of the points and also ask for clarification on some of the points. In doing so, I just wanted to point out that as I move forward and normally when I come here, I give a presentation and slides but I literally was assigned this Thursday afternoon so writing up the testimony was most of my duty. I might read this verbatim but we gave it to you earlier today so you can follow along if I do not read it verbatim.

First of all, I wanted to go over the slides that Adam Asquith went over as far as his presentation on October 9<sup>th</sup> and I just pin pointed a few slides. The first slide was entitled "Wells in South Puna." Mr. Asquith stated that the DOW has sixteen (16) County wells. The DOW actually has twelve (12) active wells in the Puhi-Līhu'e-Hanamā'ulu area. We also have eleven (11) inactive or seldom used wells. These

wells are inactive or seldom used due to a variety of reasons such as mechanical issues, well properties, hole failure, the well is only for monitoring, and our current use of the Surface Water Treatment Plant also plays a role into what wells are actually active in that Puhi-Līhu'e-Hanamā'ulu System.

The next slide I wanted to discuss was titled, "Water Use Not Reported." I think our Department at the meeting had some concerns as far as that particular slide and I just wanted to give a few more details on that. The generalization that the DOW has not been reporting all of our wells' monthly usage is misleading. The DOW's Operations Division does indeed report usage of all wells. We have recently reported monthly well usage annually and this year was no different. As of October 9, 2014 water workshop, we were up to date in reporting our wells' pumping data as of October 2013. As of today, November 10, 2014, we are fully updated on well reporting as of October 2014. I want to point out that the requirement is monthly reporting, but we have been reporting our monthly usage annually just with everything that goes on in the Department. That is something we are mindful of, but we definitely were reporting all of our usage within the last year prior. Right now we are totally up to date.

Mr. Asquith mentioned that only six (6) wells were reported for monthly use in August 2013. In a later slide titled, "Sustainable Yield?" Mr. Asquith references that the August 2013 reported use in the Hanamā'ulu Aquifer was 0.302 MGD. He may be confusing the "Hanamā'ulu Aquifer" with our "Hanamā'ulu System." Our Hanamā'ulu System contains five (5) developed wells with one (1) undeveloped well. The Hanamā'ulu Aquifer as mapped by CWRM consists of all wells in Puhi, Līhu'e and Hanamā'ulu towns, which equals twenty-three (23) total wells; twelve (12) active and eleven (11) inactive/rarely used. If you are wondering what map I am talking about, this colorful map that he had in his slide and I think a lot of you might have seen, the Hanamā'ulu Aquifer is actually the Puhi-Līhu'e-Hanamā'ulu System, so just some clarification.

The next slide called, "Metering Inaccurate," it is stated that in this slide, "Many source meters in the Hanamā'ulu Aquifer are inaccurate, at best, or altogether inoperable." This statement is not accurate. In 2005, our SCADA system that monitors our well pump meter readings was installed. SCADA, for those of you that do not know means, Supervisory Control And Data Acquisition. Since then, the system has been fine-tuned and continually maintained. Although there may be a few technicalities from time to time, as expected of any mechanical/electrical equipment, to claim that "many source meters in the Hanamā'ulu Aquifer are inaccurate, at best, or altogether inoperable," is a stretch. The slides 2001 reference is arguably outdated and does not reflect the DOW's advanced metering capabilities over the past decade.

The next slide, "Discrepancies in Estimated Use," it is stated in this slide that, "USGS reported that Kaua'i's 2005 fresh groundwater use was 29.11 MGD." This is likely for *all* water users on Kaua'i, not just the DOW. This might be something that Adam might be able to clarify further. This would include all private systems around the island, small and large (i.e. Princeville Utilities Company, Inc.).

It is stated in that slide that, "This is almost three times the County's 2005 reported use of 11.548 MGD." The DOW reported 11.548 MGD at the time because that was our lone usage for all of Kaua'i. The entire DOW system is included in that number not just the Puhi, Līhu'e, and Hanamā'ulu area. Just for reference that number was back in 2005 according to Adam's slide and our current usage right now

on any given day is 13 MGD plus or minus 1 MGD, so it is based on the time of the year and the demand at that given point. We average between 12 MGD and 14 MGD throughout the year. The Puhi, Līhu'e, and Hanamā'ulu current usage is actually 1.29 MGD from wells, and 2.03 MGD from the Surface Water Treatment Plant.

The next slide I would like to clarify is titled, "Sustainable Yield?" It is stated that in this slide that the, "total pump capacity in the Hanamā'ulu aquifer is 12.6 MGD." This statement is unclear and does not state specific locations and systems, so we cannot fully comment on that portion of his slides. It is also stated, "August 2013 reported use in the Hanamā'ulu Aquifer was just 0.302 MGD or one percent (1%) of sustainable yield." This statement should be clarified and referenced to its origin. The DOW uses 1.29 MGD for the entire Puhi, Līhu'e and Hanamā'ulu system. Through the Surface Water Treatment Plant we have decreased the groundwater pumpage since 2006. Therefore, pumpage needs have changed since the 2005 report that Mr. Asquith referenced in his slide.

Next slide, "Number of wells in the Līhu'e basin." He showed a graph in his slide that did not show the quantity to reflect the number of wells between 1920 and 2000. If you look at the graph he made, there is an exponential trend to it...the exponential trend may not be so drastic considering population rise. So the quantity of wells and the quantity of active wells serves as critical information that must be reflected when interpreting the graph. If we had that information, we could comment further but...not discrediting what he put out there, but just saying that it could be further clarified for us.

Next slide, "Why the Sustainable Yield Estimate Does Not Match Observations." It is stated in this slide that, "Wells compete with streams for rainfall recharge." This statement is true, however, we would like to question to what degree? That is the critical item. Is it negligible? Is it significant? Stating the degree of competition matters and it should be clarified. And to point on what Scot mentioned in his slide today, looking at the well placement, looking at the impact, and how we had the percentages, that is critical in looking at what type of significance that you had. I wanted to point that out because when you look at the slide that he stated, that is a critical aspect. He also stated that, "the model and stream gauge data analyses both show that most of the groundwater flowing through the southern Līhu'e basin discharges to streams rather than to the ocean." Again, we would like to ask to what degree? In addition, when a well is pumping water, what is the impact in volume? Stating quantifiable data is important and relative when making these statements. Like I said, the degree matters and I am glad that USGS pointed that out today. It is not for the Water Department, it is not for USGS to decide what is actually significant but it is to go through the process with the Water Commission.

The next slide labeled, "USGS study of the effect of groundwater pumping of certain wells on stream flow in South Puna." The data in this table should be clarified. Where were the wells? Were there additional future wells that DOW never drilled? What study is this data from? In researching his slide and some of the USGS studies that are available online, it seems like Adam abstracted data from the USGS 2002, "Numerical Simulation of Ground Water Withdrawals in the Southern Līhu'e Basin," report tables. However, this data is a simulation resulting from an additional 0.42 MGD to 1.16 MGD.

The placement of wells and the capacity they produce are the factors that affect stream flow, so that should be clarified when relating to the table in this slide. The

percentage of these MGD's for new wells, in addition to what we have today, should also be factored into consideration. The DOW is not planning any additional wells and has not drilled or developed any new wells in the Puhi-Līhu'e-Hanamā'ulu area for nearly ten (10) years.

It is imperative to note that the studies are comprehensive and more detailed than what was stated in the presentation provided by Mr. Asquith. Proper data is needed when interpreting consequences and the magnitude of the consequences should be conveyed. Consequences are minimized by careful placement of wells, and the DOW incorporates data and consequences when making water development decisions. That just reinforces what USGS stated in their slides today. It basically comes down to where you place them, how many wells you have, and the vicinity to the streams. That should be clarified.

"Project Growth." It is stated in this slide that, "in the Hanamā'ulu Aquifer, water use is expected to increase by at least thirty-five percent (35%) between 2020 and 2050 citing the Hawai'i Water Plan 2020, Section 4-8." It should be clarified that this actually references the Department of Water's – Water Plan 2020 Section 4-8 which identifies an anticipated increase in water use of thirty-five percent (35%) from 2020 to 2050 for the Līhu'e-Puhi system. DOW's Water Plan 2020 was to develop a long-range plan to guide the DOW for future operations and to identify the needed improvements and facilities required to continue to provide safe, affordable and reliable water service to our communities. The DOW's Water Plan 2020 is a useful tool, but water use may or may not reach 2020 estimates. Keep in mind that they did this in 2001 so they basically made a twenty (20) year projection so there should be a deviation in that estimated usage.

In addition, accurately forecasting growth more than twenty (20) years in advance can prove to be difficult due to many highly variable factors. It is also stated in this slide that, "In 2012, Kaua'i's population was only 480 persons below the Water Plan 2020's estimated population for 2020." Water produced in 2013 was 3.3 MGD which is twenty-one percent (21%) below the Water Plan 2020 water use projection of 1.066 MGD. Therefore it is not accurate when Mr. Asquith indicates that the 2020 Plan underestimates both population growth and water demand.

I have a couple more slides. He had a slide labeled, "Summary." The DOW cannot speak for other users, but we do know the amount of water we are pumping from our wells through our SCADA metering equipment. The observations by Mr. Asquith needs to be clarified with qualified data and should be correlated clearly when presenting to the public, in order to get an accurate and full picture of the situation. Well pumping and the relationship to stream flow must be qualified and quantified for significance of impact. The DOW, as a semiautonomous agency of the County, made the decision to utilize surface water to support existing and new customers. Mr. Asquith has recognized this educated decision by the DOW.

Finally, slide labeled "Compelling Logic." The date showing we have a significant groundwater problem needs to be elaborated. Stating the, "extreme action of the use of stream water and the associated impacts," is slanted, especially without proper data to support such a statement. The DOW recognizes the geological differences we face here in Puhi-Līhu'e-Hanamā'ulu. We made an educated decision to move forward with the Surface Water Treatment Plan for efficiency in providing water to our customers. That is all I have to cover on Adam's presentation but I have a few things that I jotted down on the UH Law School presentation and even some on

the USGS, so if you do not mind, I will cover that and then you can ask us questions. As far as Kapua's and her students' presentation back on October 9<sup>th</sup>, we have nothing to basically qualify and just to reinforce what she said. There is a process. The Department of Water is just another entity within the process overseen by CWRM, although a big user on Kaua'i. So I guess I will withhold any commenting on the designation process until that time arises. Like her and her students' might have mentioned, you know, in the end if you do designate...for us...it is kind of it is what it is. Basically all end users end up having a longer permitting process and through that you have to spend more money to do so, but if that is the right thing to do then that is just something that you have to do. The Water Department's stance on that is – go through the process and we will respect the process and like Kim said earlier, we are going to remain transparent throughout it as we continue to be good stewards for the island and uphold the public trust.

USGS' presentation, I had a chance to go to the presentation at Kaua'i Community College (KCC) several weeks ago, so I kind of touched on some of that and then listening to some of his slides today, you know the key take away is what is the magnitude of the consequences and engineering and water management decisions must be mindfully made on the data that they provide? I know you asked him a bunch of questions today but as...I guess to just reinforce them and kind of help them out...they are basically the scientist that provide the information, not the guys that actually make the decisions. It is good to clarify that that they are giving all of us, the Water Department, the community, everybody the information to actually make an informed decision. Primarily that is the role. Per Scot's slide relating to the groundwater budget, he basically said that Kaua'i receives eight hundred eighty-three million (883,000,000) gallon of groundwater recharge per day and Kaua'i is withdrawing nineteen (19) MGD. I do not know if he meant nineteen (19) or twenty-nine (29) but at nineteen (19) MGD, that means all users on Kaua'i take out about two percent (2%) of the recharge. What does that mean for the Water Department? If we are using between eleven (11) and thirteen (13) upwards of fourteen (14) MGD, we are looking at the Kaua'i Department of Water is using about one and a half percent (1.5%) of the total recharge daily. This is important fact to take away when looking at pumpage and effect to recharge and the correlation to stream flow. He mentioned O'ahu, I mean considering our usage, they use fifteen (15) times and they are saying, "They are using fifteen (15) times the amount as Kaua'i," but like you said it is not about the usage, it is about the use in the area and ultimately Kaua'i's geology is the limiting factor and specifically Puhi-Lihu'e-Hanamā'ulu has much different geology than Kekaha. I am not a Geologist, I am a Civil Engineer, and I take the data that they give us and that is how we work to develop our services and maybe Scot could comment on this later but in what I see and what we developed in the ten (10) years I have been here, it seems like the Kekaha-Waimea System is as close as you would get to O'ahu as far as geology, with the Waimea salt and all of that. In Lihu'e, you have the Kōloa formation, so a lot of people think Kōloa is in Kōloa but ultimately you can have Kōloa volcanics here and the Waimea basalt can also be in the Lihu'e Puna District also. Like I said, geology is the problem, not necessarily lack of water. I think Scot did a good presentation today saying that the water is there but it is poorly connected. So when you do install a well and you have that drawdown, similar to what Adam did with his shaved ice, you know, you put the straw and think of the cone as being an impermeable layer, and you suck the stuff and it is not there...you got nothing coming out, I mean really that is what you are dealing with. What do you do in the case of that situation? You buy one more shaved ice? It is an equivalent of what we do. If you got to put a well and you are limited by the yield that Scot said, then instead of drilling one (1) big well in the affected area then you

drill multiple small wells which is what we did ten (10) years ago by drilling three (3) of those red dots that he had; Pikake, Hanamā'ulu III, and Hanamā'ulu IV. In other words, those yield wells in the Hanamā'ulu Aquifer which is what their numerical studies presented as the direction that the Water Department should do. We have been trying our best to take the data and actually move our operations into the most specific areas and minimize the impact and so I wanted to point that out in junction with what Scot mentioned. He mentioned about not impacting the lens so that the wells do not go salty. As stewards, that is one of the biggest things...I do not know if you really caught that but it is to not impact the well lens to the point that you suck brackish or saltwater to impact that, so that is something that we monitor quite expensively with our water quality. It is something that as stewards and upholding the public trust in actually keeping the quality of the aquifer good, that is something that our branch of our Department does monitor. Then like he said, I heard him briefly talk about climate and irrigation effect on groundwater resources, you know, I mentioned this before but the Department of Water is working with UH to conduct a rainfall study and hopefully that should be done, if not next year then early 2016. We recognize that in addition to well pumpage that the climate and rainfall is definitely key to the next fifty (50) to a hundred (100) years so that is something on our radar. I am not going to be on it, but JoAnn brought up a good point about the irrigation in Līhu'e so there are extensive studies that they have done in conjunction with the Water Department and for you who might not have read that I encourage you to read that because it does play a critical role for the island especially in Puhī-Līhu'e-Hanamā'ulu and it did play a critical role in managements' decision at the time, prior to myself coming onboard in 2005 moving towards surface water. Geology is a major factor and placing wells is important in affecting stream base flow. So, thank you for the opportunity to comment on this matter and...it is more than three (3) minutes but go for it.

Councilmember Chock: Thank you, Dustin, for pointing out the perceived inaccuracies and clarifications, I think they, are important. This is what this whole intent is which is to get clear at least for us and the public so I appreciate that. I am sorry that you did not get the slides that Adam had created in time for you to respond for the workshop. I am sure he would have appreciated that but I am going to open it up for questions.

Councilmember Yukimura: Thank you for your presentations. It was interesting that you mentioned that your existing Water Plan for 2020 was off by four hundred eighty (480) people in terms of projected population, is that correct?

Mr. Moises: So I have been told.

EDWARD DOI, Civil Engineer VI: We did not dispute anything with the four hundred eighty (480) number, it was stated in his slide but the part we touched on was although he kind of mentions that the population is at a twenty (20) level, I do not know if it is, but the water in 2013 is twenty-one percent (21%) of our 2020 projection.

Councilmember Yukimura: I take it as a plus that you were only four hundred eighty (480) people off.

Mr. Doi: No, but we...

Councilmember Yukimura: That is not correct?

Mr. Doi: I...

Mr. Moises: We do not know.

Councilmember Yukimura: You do not know?

Mr. Moises: Basically we took the four hundred eighty  
(480) from Adam's slides.

Councilmember Yukimura: And you assumed it?

Mr. Moises: You know, we did not want to discredit him so given that...we took his four hundred eighty (480) for it being true and if that is true, our projection in water usage is still twenty-one percent (21%) less than what that projection would have been so we can support that growth.

Councilmember Yukimura: Okay. So you are saying that in 2013 your production was twenty-one percent (21%) below the water plan projection of 4.066 MGD, so that fact could be taken two (2) ways that you have under produced but you actually produced less than that but still met your mission of providing water, right? So, what you must have done was either reduce the per-capita of water or you must have cut down on waste. Is that fair to say?

Mr. Doi: That could have been one of our factors. We have a good public relations person who has worked on conservation and that could have been a factor, or it could have been a rainy season.

Mr. Moises: I think that it is all of the above. I mean it is conservation, it is rates – the increase in rates is a deterrent to use.

Councilmember Yukimura: Well it makes people more careful with their water use.

Mr. Moises: Yes. Like I said the Water Plan 2020 was established twenty (20) years ago and since then I think a lot of people got low flow fixtures...

Councilmember Yukimura: Right.

Mr. Moises: ...cost reduction, water reducing elements in their homes and their way of life...

Councilmember Yukimura: Right.

Mr. Moises: ...that helped us reduce our usage and you know...I come here like every year and do a CIP presentation for you, but really we did a lot of pipe line replacement and in that pipe line replacement we fixed a lot of leaking lines which is directly attributed to pumpage. So if you decrease your leaks then you can decrease your pumpage and it all goes from there. There are a lot of factors.

Councilmember Yukimura: So what this is telling me is that a source of water that we do not normally talk about comes from conservation or the less...reducing the per-capita of consumption which does not mean people are living uncomfortably but because of water conservation, you are producing...you are making more water available to others, right? So, it is actually a source of water and then by keeping our pipes updated or in a preventive maintenance mode, you are lessening the waste that comes from leakage of the pipes and therefore also having more water for people to use because if it seeps out of the pipes, it does not get to the house or the place. Okay. Thank you for that. Not affecting the lens is critical and there have been more talk about it on Maui and O'ahu because they seem to be approaching the limits there than we are and what I wanted to ask is that...are we anywhere close to that problem of affecting the lens? Or is it not an island-wide thing, let us just talk about Līhu'e. I do not know if it is a whole lens that serves that whole island or if it is localized and I would just like to talk about the Līhu'e area. With respect to the lens that feeds the Līhu'e area, are we anywhere close to a problem?

Mr. Moises: I can touch on that and maybe Scot can come up later and answer it...my understanding is that the Līhu'e-Puhi-Hanamā'ulu lens is very thick. We do not have that problem of introducing saltwater, so I do not see it as being an issue. Līhu'e and Hanamā'ulu does not have "a lack of water problem." It is an extraction problem.

Councilmember Yukimura: Right. So it covers more area. Okay. You mentioned eight hundred thirteen million gallons per day (813,000,000 MGD) in our source and we are withdrawing only nineteen million gallons per day (19,000,000 MGD) or DOW is thirteen million gallons per day (13,000,000 MGD) or something like that – I would like to talk about those figures in the Līhu'e area.

Mr. Moises: Which slide was that?

Councilmember Yukimura: Oh, no, it was just your response to, I think, both Adam and USGS' reports.

Mr. Moises: Okay.

Councilmember Yukimura: You mentioned that geology is a problem – it is not necessarily a lack of water, that was the conclusion but you had mentioned that, I think, eight hundred thirteen million gallons per day (813,000,000 MGD) as a source, is the island-wide figure, is it?

Mr. Moises: Oh, I think you are referencing his groundwater budget, eight hundred eighty-three million gallons per day (883,000,000 MGD).

Councilmember Yukimura: Oh, excuse me, eight hundred eighty-three million gallons per day (883,000,000 MGD).

Mr. Moises: Nineteen million gallons per day (19,000,000 MGD) is withdraw.

Councilmember Yukimura: Yes.

Mr. Moises: And I am not sure, he had nineteen and I guess Adam's one said twenty-nine, so I do not know which one is proper. I can only speak for the Water Department where we use thirteen million gallons per day (13,000,000 MGD) plus or minus one credit.

Councilmember Yukimura: But these are island-wide figures. What is the Līhu'e area figure?

Mr. Moises: The Līhu'e, I think, I mentioned one point two nine MGD of well pumpage.

Councilmember Yukimura: So that is the draw.

Mr. Moises: From wells.

Councilmember Yukimura: One point two nine MGD.

Mr. Moises: Correct.

Councilmember Yukimura: And what is the source that is available?

Mr. Moises: What is the source? I can tell you it is the twelve (12) active wells. We had eleven (11) seldom-used inactive wells but basically...

Councilmember Yukimura: No, I do not mean the infrastructure that is pulling up...

Mr. Moises: Yes, so you are talking about the aquifer?

Councilmember Yukimura: Yes, I am talking about the aquifer.

Mr. Moises: What aquifer? As far as what is the aquifer, I can tell you that we basically have, like I said, five (5) or six (6) wells in Hanamā'ulu and then we have some wells in the Kilohana area and when I say Kilohana, I mean by Kilohana Carriage House back in the fields over there by our tanks and then we have several more in Puhi which is up there by Kaua'i Community College (KCC). As far as the aquifer, I really cannot speak to...

Councilmember Yukimura: Okay, maybe Scot knows.

Mr. Moises: If we are tapping all of the same...but one thing I can tell you is that the aquifers are very confusing because Steve and Scot might have mentioned that we have partnered with them on a well exploration program back in the 90s. When I came in 2005, we were developing these wells and I did a well development for Pikake, Hanamā'ulu III, and IV but we had a well up in Wailua Homesteads where we piggybacked the well that they drilled and we got the portion of land, it might have been only a hundred yards away – totally different yield and we ended up not developing that well. I cannot speak to that but maybe Scot can.

Councilmember Yukimura: What I am gathering is that we may have a lot of water in these lens under the island whether...and I am talking Līhu'e now so

correct me if I am wrong, and there is a lot of water there but the dynamics of the geology and everything does make it more difficult to draw on that water.

Mr. Moises: Correct.

Councilmember Yukimura: My last question for this round, you are embarking right now on a Water Development Use Plan an update on your 2020 plan which was done....what...twenty (20) years ago now?

Mr. Moises: No, like fourteen (14).

Councilmember Yukimura: Okay. What is the status of that and will that plan address Līhu'e?

Mr. Moises: Maybe Eddie can take on the water use and development plans since that is what he does.

Mr. Doi: So right now we are moving forward with the water use and development plan and we just got a revised project description, we will tweak it a little bit and sometime in early December, we hope to redo the advisory book.

Councilmember Yukimura: When do you plan to have it done?

Mr. Doi: We plan to have it done as soon as we can.

Councilmember Yukimura: Surely you have some calendar – like one (1) or two (2) years.

Mr. Doi: I think they needed to revise this timetable and I do not have it off hand, but I can send it to you.

Councilmember Yukimura: Okay. But your present timetable projects another year or two (2) for that water...

Mr. Doi: I would say a year or a little longer.

Councilmember Yukimura: Okay.

Mr. Doi: It kind of depends on how things move between scheduling meetings...

Councilmember Yukimura: So you are gathering the data right now?

Mr. Doi: The consultant is gathering...

Councilmember Yukimura: Who is your consultant?

Mr. Doi: (inaudible) Associates.

Councilmember Yukimura: And they are going to begin working with the Advisory Committee and then, I mean, if it is like most plans there is going to be a first draft and a public hearing...

Mr. Doi: Yes, I believe we will get input from our Advisory Committee and then possibly (inaudible) the project description of how they want to proceed and then go through the...

Councilmember Yukimura: The public hearing?

Mr. Doi: Not public hearing, maybe go through the agency that is going to oversee the thing.

Councilmember Yukimura: I see. Which is probably the CWRM.

Mr. Doi: Yes.

Councilmember Yukimura: And that plan, I would assume, it is supposed to project like the existing plan did how you are going to make the water needs of the community for the next twenty (20) years, right?

Mr. Doi: Yes, they are going to identify sustainable yields in there.

Councilmember Yukimura: But will they not also identify how you are going to get those yields and what the infrastructure needs will be and what the costs will be in order to deliver them and also what the impacts will be on stream flow and other things like that?

Mr. Moises: Just to answer that, I think what is going to happen is the Water Use and Development Plan will be complete and once that is completed and the County General Plan is completed then we will come in with the Water Plan 2040. It really depends on how quickly the General Plan is done and I think they are saying 2015-2016 and then after that we will take all of those projections and (inaudible)...

Councilmember Yukimura: Okay, but...

Mr. Moises: ...and then do our infrastructure plan.

Councilmember Yukimura: Alright, but you do not have to wait that long because the Līhu'e Community Plan is already underway in terms of the Līhu'e area and my concern as a Councilmember is there is a lot of talk about Līhu'e being the center and the area of growth and so without water that is not going to happen. There is a disconnect if there is not a clear pathway for providing the water that Līhu'e needs. You do not need to wait for the General Plan which will take a few more years because the Līhu'e Community Plan is going for public hearing...or already went through public hearing before the Planning Commission and it is going to be coming up to us.

Mr. Moises: I understand where you are coming from, that is a good point, just keep in mind that the Water Plan 2020 is in its third phase right now. The Līhu'e and the other areas around the island are changing based on what was projected over the last fifteen (15) years and this does not mean that the Water Department cannot adjust and satisfy those needs, as long as they are not way, I

guess, higher than our projections but we do meet yearly and we do readjust the Water Plan 2020.

Councilmember Yukimura: I am very glad that you have that flexibility and then the question will be to you based on the Līhu'e development plan what is both the cost and the timetable for providing that water for Līhu'e that is going to be the question. What impact will that Plan have on stream flow and other concerns of the community?

Mr. Moises: Yes. That is a good point. That is something that we are definitely mindful in looking at.

Councilmember Chock: Okay.

Councilmember Yukimura: Also it is an alternative to a water designation or not, I do not know. But the decisions will all be leading to that question. Thank you very much.

Councilmember Chock: Thank you. Councilmember Bynum.

Councilmember Bynum: Thank you very much for the presentation and helping increase our understanding of these issues. I want to stay with some big picture questions and based on some of the things you have said. You mentioned that if we do go to groundwater management then all the end users have to be identified and there will be more permitting and we know the very important end user is the Water Department, obviously, because that benefits all of us. But the big picture overlay is that the Hawai'i Supreme Court is telling us how to prioritize those end users, yes, are you aware of that, correct? And some of those end users do not have their needs met at all, right? So like, one of the biggest concerns and Steve mentioned that there are a lot of priorities such as coastal environment stream flow, the Supreme Court has made it pretty clear having data that increases natural stream flow is an important goal. In essence, the stream itself is an end user in that scenario, correct?

Mr. Moises: Yes, I am not sure what specific case you are talking about but in general I think it has been a Statewide issue and I would agree that people, streams – are all end users.

Councilmember Bynum: So one end user that may not be getting their needs met now is the stream, another end user – our *kuleana* landowners who do not have access at all in some instances that they once had, correct?

Mr. Moises: Which could be, but again that is something that I think the Water Commission would have a better idea than the Water Department.

Councilmember Bynum: Right. I am just saying you are giving us the technical overlay, which is great, but what we have as policymakers is also a process being driven in our State that is going to identify end users. When I look at the big picture and look at the presentations we have had, you agree that a hundred percent (100%), for instance, on the north fork of the Wailua River, a hundred percent (100%) of the base flow is a currently diverted, correct?

Mr. Moises:  
We do not operate the diversions.

I cannot agree to that because I do not know.

Councilmember Bynum: Well I have been up there a bunch of times and part of Adam's presentation was showing pictures of the base flow, and the diversion. The big question, if Wailua water is going to be restored to the Wailua Stream, those end users take...does that not exacerbate our problem here pretty dramatically?

Mr. Moises: I mean I think the big thing is once USGS does their study, I think that is going to give everybody a better idea of what is going on and right now the Water Department, we cannot comment on that because we do not have that data.

Councilmember Bynum: The only point I am trying to make, Dustin, is that we have these current needs and then there are folks who do not have those needs and that is this whole water management process and identifying all those users, prioritizing their needs. If we have the stream that needs water and we are already taking it for Lihu'e, if the Supreme Court says that stream gets half of its natural flow back, say, so it actually hits the ocean on a regular day then that is less water for us to divert for surface water use here. That is the disconnect for me. I mean we have these technical issues and the Water Department has done an outstanding job of delivering through to the best of their abilities the water for potable use, but we have a model. We know what happened in Maui. They just completed that. CWRM said, "this stream is going to get  $x$  amount," I do not remember the numbers and the Supreme Court said, "No, the stream is going to get twice that." Somehow they had to adjust, right? I just wanted to hopefully...you understand that there are bigger picture issues that the end user may need to re-identify and then we are not talking about redistributing our current water usage, we are talking about redistributing it and letting those end users have their fair share as well, right?

Mr. Moises: Yes, we recognize what the big umbrella is to the issue, but like we said earlier, even with the qualifications I put in Adam's slides, you got to have the data. Right now the data is not there and USGS in partnership with the Water Commission is going to look at that data to answer your question. At that point I think everybody in the community, the Water Commission, you folks, and end users can look at what is actually going on. I have been up there but I cannot tell you if a hundred percent (100%) is being diverted or not, so I am not going to make that type of comment on the record. I do think that once they do the study everybody will have a better picture because it could be anything, nobody knows.

Councilmember Bynum: I will close with that. You recognize that these upcoming studies that USGS was talking about is really important for us to continue.

Mr. Moises: I think every study they do is important in some shape or form or it would not be commissioned. I think you just have to keep that in mind, that before anybody makes a decision that the data has to be there.

Councilmember Bynum: It would be appropriate to acknowledge those managers in the Water Department in the past. They had the foresight to work for this and give us the data we need to try to address our current problem. Thank you for that.

Councilmember Chock: Any further questions? I want to thank you. Yes, we have been going for a while. Let us do a caption break.

There being no objections, the meeting recessed at 3:13 p.m.

The meeting was called back to order at 3:22 p.m., and proceeded as follows:

Councilmember Chock: *Aloha*, we are back from our break. I want to thank again all the resource speakers who came up today. We will have Kapua and Adam for a few minutes here to give us a short refresher of where we came from and then I am sure we will have some questions. I would also like to invite any of the representatives who spoken today from the Water Department, they might have left already, and also USGS. Thanks for being here, I appreciate it.

DR. ADAM ASQUITH, University of Hawai'i (UH) at Mānoa Sea Grant Program: Do you want me to just repond to the Water Department or...

Councilmember Chock: I think that would be great and also if you could just...why are we here? There is an intention here that you came with, I think it will help bring us back to where we need to go.

Mr. Asquith: I think all of us are here in response to the community groups interest in seeing, I think in their words, restoring a balance to the waters in Puna. I think that was some of the words from their letter. And so in order to partially address that at this stage we are in an information/gathering stage, sharing that information, discussing the extent of the data, the gaps, and the interpretation of that information, and understanding the policy and laws. That is part of largely my role in helping the interface between the community, the scientists, consultants, and so forth. I was asked both by the community and the Council to kind of launch the discussion and that is where we were at.

I gave my presentation at the first workshop and the Water Department raised some issues, fairly specific issues about the presentation...I think this is probably not the time to go back and forth about the specifics, I will just respond that one of the great things about being an Extension Agent rather than a straight researcher like the USGS is that I am just the messenger, it is not my data. It does not prevent them from shooting the messenger which in this case I would argue that is kind of what happened because in largely I stole my slides. I stole the tables from the researchers; themselves, in this case is a lot from Scot. If there were misinterpretation of the data, I will take full responsibility for that. I did not think it was as much of that rather than I think the issue that was brought up by the Water Department was one of the exact issues that I was hoping to present and that is inconsistency in the data that is held by different bodies, inconsistencies in the data through time, and understanding what the data applies to – is it the Hanamā'ulu Aquifer alone or is it the entire island? In order to fully understand the question at hand, we have to understand those data whether they are fully accurate with regard to the area that we are interested in and whether they are up to date. I am happy to address any of those specifics but in general, I think everything that I presented was accurate and everything that the Water Department responded to was accurate.

Councilmember Chock: Thank you. Would you like to add anything?

D. KAPUA'ALA SPROAT, Professor, Ka Huli Ao Center for Excellence in Native Hawaiian Law and the Environmental Law Program at the University of Hawai'i at Mānoa, William S. Richardson School of Law: *Aloha mai kakou.* On October 9<sup>th</sup> together with students from our Environmental Law clinic, we provided a briefing for the Committee on kind of the context of the cultural and legal context for water resource management on Kaua'i with the focus on sort of how the public trust and precautionary principle inform this Council's *kuleana*. Specifically with respect the question of the designation of the groundwater management area for the Hanamā'ulu Aquifer in particular. It is sort of understanding that it is 3:23 p.m., and you folks would like to be *pau* by 4:00 p.m., I am happy to answer any specific questions that you may have for me with respect to the law or the summary that we presented several weeks ago. I would also just note one thing because Dr. Asquith is so polite, I think people really lit into him for the statements that he made with respect to insufficient, well the lack of data that had been submitted on the part of the Water Department. I would just note that as was clarified by Dustin a few minutes ago, as of the presentation on October 9<sup>th</sup> the Department of Water Supply had only submitted reports as per the usual practice or what have you but through the fall of 2013. At the time that Adam did his presentation, his statement that the reports were not currently up to date was correct. So he is... I think he is very polite in responding to that, but I would just...because I think people are really taken to him as far as not having the information but everything that he presented was accurate. But any questions for me in the "law" I will be happy to answer.

Councilmember Chock: I am going to open it up for questions but given the amount of time, we would want to invite the other stakeholders to also join us – we only have two (2) mics so we have to take some turns in answering questions. For me, as we move forward is looking at idea of some solutions or things we need to get done moving forward in order to move in the direction of seeing all stakeholders get what they need and want on this island. With that, I will give it to Councilmember Hooser.

Councilmember Hooser: Good afternoon. Two (2) things: one (1) is about process, you mentioned that we are here today because of the search for balance. What would be the...if we could restate the specific process that the community or you folks will be proposing? Is it to seek...what?

Mr. Asquith: In my professional role I cannot advocate anything in particular, but I will point out that there is an accepted State procedure for addressing these concerns and that is designation of a Water Management Area and basically it just requires a complete accounting of the water that is available and the water demands and make sure those (inaudible) and to me that is pretty straight forward. That procedure is out there and it is used in other situations that have similar problems.

Councilmember Hooser: And it could be initiated by the community, by the Council, by...and how long does the process really take or reach a conclusion of some sort?

Ms. Sproat: Those are great questions. In Sections 41 – 46 of the Water Code, so it is Hawai'i Revised Statutes (HRS) Section 174(c) 41 – 46 that outlines the process for designation. Basically any person including Hui Ho'opulapula Na Wai o Puna, an affected community group, can file a written petition seeking designation of a ground or surface water management area. Generally, once

that has been done there is a sixty (60) day time period that starts where investigations are conducted and consultation takes place between affected community members including...and/or agencies so like the County Council, the Department of Water Supply, the Mayor's Office, so the Commission would sort of say, "Okay, what do you folks think about this? Would this be helpful?" In addition there are opportunities to partner with different agencies for get information, if that information is missing. At that point then the Water Commission decides whether or not to move forward with the designation process and if they do that a public hearing is held within the hydrologic unit so somewhere within the southern Līhu'e basin. The Commission staff prepares a findings of fact and once that is done, people...that then goes back to the Water Commission for decision making, usually so there is a sixty (60) day initial period for consultation and then the ninety (90) day period for a hearing and findings of fact. Honestly, things are not usually wrapped up in that short of a time period. One example would be a petition for designation of the Keauhou Aquifer system which was filed in September of 2013. My understanding is that it is still being contemplated, you know, considered before the Water Commission findings of fact can be...are being prepared. It is supposed to be sixty (60) days and another ninety (90) but often it stretches to a year or more.

Councilmember Hooser: Okay. There is a lot of talk about data, the need for data, the conflicting data, is it possible that the process might say that we are going to wait for this new data to come in and there are some discussion about studies that USGS is doing now – is there a possibility also?

Ms. Sproat: Absolutely. In fact the situation with the petition for groundwater management area designation for Keauhou, in Kona, different County's entities were concerned that there were ongoing studies and those studies would not be completed until September of 2014 even though the petition had been filed a year before. The affected agencies requested an extension of time so that they could get more data in order to make an inform decision as far as what their position on designation would be.

Mr. Asquith: If I could add to the answer to that. I would caution us to distinguish between the data necessary to identify that we have a problem which is the trigger for a Groundwater Management Area and identify the data needed for solution which further studies such as the one indicated by the USGS would help provide. We may have all of the information we need to identify we have a problem.

Councilmember Hooser: And just to restate the problem, I think, as I heard it as an individual Councilmember here although there are lots of data and slides from both you Dr. Asquith and USGS, specifically was that because of the geology of this particular area, the Līhu'e area if you would, the taking additional water out of the ground affect stream flow almost directly. Is that the short summary of the problem?

Mr. Asquith: I think that is one (1) of them. Scot also mentioned that it is the drawdown, so if you steal from the streams as we pump in Līhu'e basin that has both biological, social, and cultural impacts and also the drawdown itself then has engineering and delivering impacts.

Ms. Sproat: If I could add to that. I think that is one (1) of the most important takeaways from today's presentation. I think Scot and Steve were

very helpful in providing more specifics on the unique hydrogeology of this area and what that means for us is that on Kaua'i and especially in the southern Līhu'e basin of Hanamā'ulu in particular, although we have all these abundant resources saturated perhaps all the way to the surface of the land, the complexity of the hydrogeology or geology of the area makes it one (1) difficult to tap and two (2) that means everything is connected. That if we take water from a certain area, it leaves based on the numerical modeling that has been thus far by Scot, there is almost a 1:1 relationship between the ground and surface water resources. What that means is tapping the groundwater affects stream flow and what that then means is to sort of relate back to what the students presentation on October 9<sup>th</sup> is that if we know that the use of groundwater resources is affecting streams then under the public trust and precautionary principle. That mean that State and County agencies that are making these decisions have to consider the implications of their decision and have specific obligations as fiduciaries under the public trust to preserve and protect the natural resources and cultural resources as well.

Councilmember Hooser: Great. Thank you.

Councilmember Bynum: The question raised, why are we designating groundwater management and why not surface water management. My understanding and I just need you to confirm it that the way this has evolved, it does not matter because it is so inter-related basically if you do a groundwater management area you have to look at all the surface issues or vice-versa, have I got that right from a legal perspective?

Ms. Sproat: I think from a scientific and legal perspective. I mean ultimately the strategic decision on the part of Hui Ho'opulapula Na Wai o Puna as to whether or not they would seek designation of a ground or surface water management area or a petition to amend the (inaudible) stream flow standards. I mean that would be their strategic call but regardless which tool is used because of the inter-relationship between the ground and surface water resources, there are legal consequences that public entities like the County and the Department of Water Supply need to consider.

Councilmember Yukimura: I have a follow-up. Dr. Sproat or Professor Sproat.

Ms. Sproat: Kapua is fine.

Councilmember Yukimura: In the process of designating a water management area, does the Water Commission develop a plan in any way that allocates or actually defines the balance that should be held or is the vision to do it on a case-by-case basis which to me makes it pretty difficult to do?

Ms. Sproat: That is a good question. Basically, the designation of a water management area whether it is a groundwater management area or a surface water management area what that does is it is sort of like zoning. It adds an additional layer of protection or permitting over whatever the particular area is that is designated and the principle change that happens is that an additional permit, a water use permit is required. So that means is that almost all consumptive uses of water with an exception of certain things like individual domestic or household needs but most uses have to apply with this permit. That is a system that is in place. Now, the water use permitting process is helpful in the sense that it

provides opportunities for affected stakeholders whether that is Department of Water Supply, Grove Farm, and people like Auntie Debbie. They can then review the applications that come forward, comment on them, raised questions or objections but at least all of that information is out on the table and everybody is entitled to the same information and there is a legal process that kind of dictates what happens. The negative is that it takes additional time but one (1) thing that I did mention at the October 9<sup>th</sup> meeting that most folks did not seem to remember is that although there is this additional layer of scrutiny, that provides certainty for decision makers and businesses. Because if you wanted to put a development in Puhi or someplace and you are not sure about whether or not there is going to be sufficient water to support your development. I think you would want to know at the outset not after you stuck all this money into planning and phasing – have the houses built and then find out there are not meters to apply to them. Although it does take additional time, it also provides certainty which, I think, would be helpful. You asked a question earlier about the Department of Water Supply with respect to the water use and development plan and that is sort of what I would point to as being the planning process. The Hawai'i Water Plan is kind of the heart of the Water Code Management framework and there are four (4) different parts of that: the Water Commission completes the water resources protection plan which is supposed to inventory all of the different needs, uses, and rights, that sort of thing. Each County then prepares a water use and development plan which Eddie pointed out, as kind of in the process of being updated right now. That water use and development plan is set forward or at least the requirements for it is set forward in 174(c) 31(f) and there are three (3) major components. Each County Water Use and Development Plan is supposed to include the status of water and related land development including an inventory of existing water uses for domestic, municipal, industrial users, agriculture, a whole range of things. The second thing is future land uses and related water needs and the third is regional plans for water developments including recommended and alternative plan cost, and what have you. That Water Use and Development Plan is sort of the mechanism at least on the County level of what supposed to govern and who does what. Now, there are two (2) other parts; the State water projects plan and the water quality plan that are put together by the Department of Agriculture and the Department of Health. But the Water Use and Development Plan at the County level is where you will get most of the information.

Councilmember Yukimura:        So does the Water Use and Development Plan include stream flow?

Ms. Sproat:                                It depends on whether or not there is a surface water system that is supplying water and based on my understanding of how things operate in this area, I would assume that would be...because that is a source for County water, that would be part of the information that would be provided. Now, in general the water resources protection plan is sort of an inventory of the resources and the County water use and development plan helps to forecast what the County's needs are based on what the Water Commission terms authorize plan use and that is basically, the legal term where they have to forecast what the future development plan is going to be in an area.

Councilmember Yukimura:        But it is not really addressing agriculture use or other uses other than potable water, right?

Ms. Sproat:                                Well actually no. Although there is a separate State water projects plan that the Department of Agriculture prepares, in 174(c)

31(f)1, it says, "that amongst the things that the County water use and development plan shall include," so that is a requirement, "includes the status of water and related land development including an inventory of agriculture, aquaculture" so it lists agriculture in there.

Councilmember Yukimura: I am somewhat concerned about the permits that are issued by the Water Commission in a designated area. What if... I mean by not taking the big picture in mind, what if there is somebody else down the line that really is entitled to the water, could be a cultural user but in the issuance of the first permit it is not even on the table.

Ms. Sproat: That is a great question. I am here today in my capacity as a Professor at the Law School and the Director of the Environmental Law Clinic. In my past life as a fulltime litigator with Earthjustice, which is a public interest environmental litigation firm, I worked on designation of different areas on Maui for both ground and surface water management. Speaking from that experience, some of the people that I knew petitioned for water management area designation did so because they had superior rights and what we explained on October 9<sup>th</sup> is sort of public trust purposes. Either for environmental protection, or traditional and customary Native Hawaiian rights, or individual domestic needs, and they felt that the current system was not basically respecting their right although on paper they had priority. In practice they were not receiving the water that they needed and so they actually sought water management area designation as a way to sort of bring additional layer of management and protection and ensure that they would get the priority that the law requires.

Councilmember Yukimura: But what if there were somebody else outside of that group that is entitled either superior or equal too and they get left out of the first permitting process, then what? Which to me, if you could have a plan you could actually look at the big picture and this inter-related rights and try to allocate fairly.

Ms. Sproat: Right and I agree with you. Designation is a blunt instrument and it is not perfect but it is what a lot of people utilize because it is a legal tool that is available under the code. I was very hopeful that Eddie mentioned that Fukunaga and Associates have been contracted and they are going to begin doing work and so hopefully they will address many of these issues in the update to the water use and development plan. With that said, if an area is designated, that triggers a process for water use permits. There is a one (1) year period where people with existing uses can apply. People with superior rights or the folks that you mentioned like someone with a traditional and customary Native Hawaiian right like Auntie Debbie, they can apply anytime. They actually go to the beginning of the line. Say someone has a superior right, they have *kuleana* land and they want to grow kalo, and they do not live here so they miss that first year long period, they can apply later. If there is not enough water to allocate to them because they have a superior right there is a condition in all of the water use permit standard conditions that permits for people with private commercial uses or other rights that do not raise to that level of a public trust purpose can actually be reduced in order to make sure that water is provided for people with superior rights.

Councilmember Yukimura: But then there is no certainty.

Ms. Sproat: You are right. I mean there is no...and I guess another issue that I have is that these...as I mentioned designation is a blend

instrument. It provides this process but that process is long and can be complex and can be difficult to navigate without an assistance of an attorney. It is not perfect but I have seen people in Maui County in particular utilize it because they felt that it was a better option and the permitting process there is still unfolding so we will have to see whether or not in practice it was a better option. It is what folks have utilize.

Councilmember Yukimura: It seems that the Department of Water here has an opportunity to do some groundbreaking plan. It seems overwhelming complex, but if they could figure out how to do a good plan that involves right holders, at least, to the extent possible then the permitting under a designated area or otherwise would be more rational and have more certainty.

Ms. Sproat: Possibly, and actually the Water Commission is also in the process of updating its water resources protection plan and for the first time they are looking at water for traditional and customary Native Hawaiian rights. There are multiple opportunities for affected stakeholders to engage whether that is with the Water Commission through the water resources protection plan update or with the County – through the water use and development plan update, or through the designation process.

Councilmember Yukimura: Thank you.

Councilmember Chock: I am going to give the floor to Councilmember Bynum. Jenelle is asking anyone in the community if they want to provide public testimony as well. Given that, we are moving towards the end.

Councilmember Bynum: Part of my education experience was watching this unfold on Maui and so there are two (2) things that I want to get out. What I was saying earlier when you said, "From some users perspective the laws is not currently being respected," right? I said earlier that there were end users who currently have high priority who are not getting...that is correct, yes, and is it not the first one the streams. Am I right about that?

Ms. Sproat: My understanding of why this workshop was organized and why the Environmental Law Clinic and Sea Grant were asked to help provide information was because Auntie Debbie Jackson and other members of Hui Ho'opulapula Na Wai o Puna who have traditional customary Native Hawaiian rights or who have *kuleana* rights are not getting sufficient water to satisfy their needs and so they are seeking another option and basically looking to utilize this legal handle of designation of a water management area. Yes, that is my understanding as well that they are people whose rights are not being respected and that is why people are considering this option of designation. You are also correct that the law articulates a hand full of public trust purposes, the first one being environmental protection, the others being traditional customary Native Hawaiian rights and purposes, domestic water rights, and then reservations for the Department of Hawaiian Homelands. Those four (4) public trust purposes have priority over private commercial needs or basically any other uses.

Councilmember Bynum: In practice say in Maui for instance if you can give a quick synopsis. My understanding is that they went through this process, the Administrative part said, "This is how much water is going here," but the Supreme Court said, "No, it is going to be more." That has happened more than once, right?

That the choices that the State Administrators made and recommendations were overturned by the Supreme Court, have I got this right?

Ms. Sproat: That is also a correct assessment. Hawai'i has some of the most progressive laws in the context of water and the public trust and is looked to not just locally or Nationally but around the world as a model of how things can be done. Now that said, although the black letter law, what the law says is one thing, on the ground and in the community those laws are often not enforced and unfortunately the Water Commission has been sued or its decisions have been appealed multiple times before the Hawai'i Supreme Court. Yes, in all of those instances...in almost all of those instances, the Commission's decision has been reversed and the same with respect to Na Wai E Hau most recently, yes, they made a decision to restore water to only two (2) of Na Wai E Hau's four (4) streams and when that was appealed to the Hawai'i Supreme Court, the Hawai'i Supreme Court remanded that decision and actually just a couple weeks ago more water was finally put back into the streams.

Councilmember Bynum: Getting specific here to Kaua'i, presumably at some point the North fork of the Wailua River will have some of its natural flow restored but currently, it is all diverted. The Huleia River will have some of its natural flow in stream and its currently all diverted, it is base flow. When we look at priorities, *kuleana* landowners like Debbie folks, Hawaiian homelands owns a whole bunch of land that they made clear they wanted developed, and so if there is a commercial development over here that need water and Hawaiian homelands need water over here, they are going to be first up, yes? I think that is the big picture the public needs to see is that the Supreme Court have been driving this, if I have this right. These decisions will take time and they are complex and there will be much nuance but basically we have a sense of what some of the big outcomes will be. In our unique geological circumstances here, there is a huge disconnect as Councilmember Yukimura said when we have an emerging development plan that says, "let us put all of our growth, most of it, in this basin," but yet this competing needs, even with current sources are not going to be adequate. Have I got the big picture here right from a legal perspective?

Ms. Sproat: Well legally that is an accurate kind of explanation. Scot or the folks from USGS or the Department of Water Supply could provide better information on exactly how much water is being used where, but I would note that even a relatively small amount of pumping within the Hanamā'ulu area one million gallon per day (1,000,000 MGD) spread out over a hand full of wells, that is still the amount that could satisfy, say Auntie Debbie's needs. So, there is a direct impact and I would also note and as this Council is well aware the Kaua'i Springs decision that the County won before the Hawai'i Supreme Court and in part of that was the that Planning Commission could not award a permit to someone who wanted to take water from a tunnel because that person could not establish that there would not be an impact on public trust purposes. This is going to affect a whole range or it does affect a whole range on County decision making both from the Council and the Department of Water Supply, the Planning Commission, and others.

Councilmember Bynum: Just to close on this and thank you. You are correct this workshop was an attempt to address these various technical issues and it was scheduled because Debbie guys asked. They said, "Hey, we have this issue and we are contemplating a petition, we want to talk to our government leaders about it," and that is what we are here today at least on a process issue. Thank you.

Councilmember Chock: I was talking to our County Attorney about options as you stated here so I wanted to ask if Mauna Kea could also join you to talk a little bit more to it.

MAUNA KEA TRASK, First Deputy County Attorney: *Aloha.* Thank you for having me today. Thank you, Kapua, I read her book on this subject. It is very informative. I used it to prep. Read that, it is a good one. There is also another thing that you were talking about real big instruments and big movements and that is true. Kapua mentioned that in her book, these are hot contested issues, designation is a big thing, Councilmember Bynum has mentioned in the past that really what we are dealing with here is some of these issues pertain to the agriculture legacy in Hawai'i. The first sugar operation in 1835 was in Kōloa so a lot of diversion and those two (2) there because there is not much water there. But there is also under 174(c)10 dispute resolution. In lieu of going along drawn out process and designation water management area, you could also in 174(c)10, "The Commission shall have jurisdiction Statewide to hear any dispute regarding water resource protection, water permits, or constitutionally protected water interests, or where there is insufficient water to meet competing needs for water, whether or not the area involved has been designated as a water management area under this chapter." CWRM has built in almost a mediation process that could be taken advantage of which is just as binding and that is an option there too. Also 174(c)2(b) and it is a Statewide plan, multi-departmental CWRM, Department of Health is the water quality portion, State Water Projects is DLNR, State Agriculture Water Use and Development Plan is Department of Agriculture and of course the water use and development plan is the respective County Water Boards. Also too I would like to... and Kapua talks about this in her book CWRM is a sub-department of DLNR. So it is a classic agency that has so many responsibilities and so classically underfunded level staff, that is not a value judgment, I have a lot of friends there, but that is fact. I know this body and working with the County for the past few years, there is always an issue that comes up, "What is State doing about it? What are the not doing about it? What is the Feds doing or not doing about it?" The thing is when you go through designation process, you give plenary control to the State of our water. That is why this is a big decision. One of the things and Kaua'i Springs is a great example, I just wanted to state this for the record, Kaua'i, the County government and the various agencies, we have a good, I think we have a good relationship with the public trust in regards to water and Kaua'i Springs illustrates that. This was not a case whereby we granted a permit and somebody contested that and then it was overturned and we made a mistake, for a lack of a better word. It is actually we upheld what we felt was our public trust obligations. Our County Planning Commission, our volunteers, they stuck by their guns and they were vindicated. I just wanted to make that known to the public and to the client. We do a good job here, you know, as the Supreme Court case shows.

Councilmember Chock: Thank you. We have one last round of questions to any one of the resources today and then we need to go to public testimony and wrap this up.

Councilmember Yukimura: I have a question for Professor Sproat. I just wanted to know if water for affordable housing is covered by the public trust doctrine?

Ms. Sproat: That is a good question. Generally that is not one of the public trust purposes that have been delineated. Now there is a difference between public trust purposes which have the highest priority and then public

purposes which are things like the Department providing water for municipal use, agriculture because of the provisions in the State constitution are a public purpose. Affordable housing has not been delineated as a public trust purpose but I think it certainly would fall under the public purpose and again part of that would depend on the County ordinances and that sort of thing. If there are specific provisions or priorities for affordable housing than that could increase its status. I think Mauna Kea is right, Kaua'i has shown tremendous leadership with respect to the public trust especially by the Planning Commission. I think the Department of Water Supply has an opportunity through its water use and development plan to rectify these issues but part of that has to be done in partnership with Grove Farm or other folks who are kind of managing the ditch systems that are affecting folks like Auntie Debbie but there is definitely an opportunity and if this can be accomplished on a County level without having to go to the Water Commission than that would be fabulous. Often times going to the Water Commission is a situation of last resort but that people take when they have no other legal recourse.

Councilmember Chock: Any further questions?

Councilmember Yukimura: I have a question for Auntie Debbie later.

Councilmember Bynum: One of the things we have considered is that perhaps the County Council could petition, what would be the implications of that? Why would we want to do that or why would we not want to do that?

Mr. Trask: On that, the appropriate party to answer that question to give the Council advice on this would be the County Attorney's Office. I do not want to put Kapua in a bad spot on this one.

Ms. Sproat: Oh, that is so generous of you, Mauna Kea. He does not want to know what I think. It is up to you whether...

Mr. Trask: I mean I am sure you can ask her questions off the record, whatever you want, but I am just saying for record purposes to get legal advice from not the County Attorney, it will just confuse things.

Councilmember Bynum: I am asking her opinion. I would be happy to hear your opinion as well after I hear hers.

Ms. Sproat: As far the things for the Council to decide in consultation with the County Attorney in making this decision is that often times, in the past when designation has been considered by the Water Commission whether that is for ground or surface water management areas, the position of the County has been very important. Where either the Council or the Mayor are often times, all of the various agencies have taken a unified position that is something that the Water Commission has considered very heavily. To the degree that the Council would file a petition will then...that would be something that the Commission would weigh very heavily but that would also be balanced off of what the Department of Water Supply and/or the Mayor might think.

Councilmember Bynum: Thank you. Did you want to answer as well?

Mr. Trask: Yes, it is a complex question, just beyond that though, I would be happy to speak with the body later.

Councilmember Bynum: Thank you.

Councilmember Chock: Thank you. We have one (1) question for you, since you are the center of discussion today. Councilmember Yukimura, you have a...last question here before public testimony.

Councilmember Yukimura: Thank you, Auntie Debbie. Can you give your full name and then answer this question. Have you quantified the amount of water that you need and want? Has your organization...because it may not be just your family or *'ohana*.

DEBBIE LEE JACKSON: I personally have not quantified the amount of water that I need. This has just gotten so much bigger than I even imagined.

Councilmember Yukimura: Yes, I get a sense.

Ms. Jackson: All I see is...there is not enough flow to push through to get to my lo'i. And that is just a personal thing but this is not just for me, this is for our future that I see this going.

Councilmember Yukimura: I know Professor Sproat had mentioned that actually if your problem could be solved that a water designation is kind of a last resort and if there were other ways to really meet your needs or the *'ohana*, I am not clear who that is and what the needs are but that is why I asked. We just want to...because as Councilmember Chock has said you are our immediate concern that I just wanted to get a sense of what is needed and wanted and what the nature of the response needs to be in order to get your lo'i the water it needs. That is why I asked. It is something we can talk more off record.

Councilmember Chock: Off record...

Councilmember Yukimura: I appreciate the courage and the commitment that it takes to step forward. Thank you.

Councilmember Chock: Thank you. Great, at this time I would like to ask for public testimony. Can you call the first testifier?

DON HEACOCK: Good afternoon Councilmember, my name is Don Heacock. I wear a number of different hats. I also sat as the Water Chairperson for the Hawai'i Farmers' Union United. We absolutely support the better wise use and sustainable use of both agriculture and water. Those two go hand in hand, in fact, water is our most limited and important resource. Part of the reason we are all here is we are going through a paradigm shift. In 1920, civil engineers' idea of storm water protection was take every stream, straighten it out, concrete line it, you see them all over O'ahu. That puts tomorrow's drinking water out in the ocean which is very inefficient. The new paradigm is to spread that water out over the watershed and let it slowly percolate into the ground – it is tomorrow's water and it can be used for agriculture wisely. The other paradigm shift is we have been treating water like a commodity where we shift it from one watershed to another. The problems in California are almost unmatched. The Environmental Protection Agency, (EPA) has told Los Angeles that after 2020 they will not send water from the San Francisco, San Joaquin Delta down to Los Angeles County anymore. You can only imagine the social

economic issues that will drive but we are doing the same thing. We are stealing water from Kimo to pay Kalani. The new paradigm will need to balance groundwater development with the protection of in-stream flows and the biological, cultural, and ecological resources they support on a watershed-by-watershed basis. Not by stealing it from Peter to pay Paul or we are going to end up just like California. I am going to try to walk here lightly, as you know I am the District's Fishery Biologist with the Department of Land and Natural Resources (DLNR) and I certainly cannot speak for DLNR, only (inaudible) at least for a few more weeks can speak for DLNR. But I have been writing nine (9) different Chairmen over the years saying we have to have a clear Memorandum of Agreement (MOA) between the Division of Aquatic Resources that is mandated to protect all living aquatic resources in the State and their habitats which include everything from streams, by the way, the Army Corp of Engineers defines streams and rivers in the 1890s. River discharge into the ocean, it does not matter how big or small they are. Streams discharge into rivers. Hanakāpī'ai is technically a river, just for that clarification.

Councilmember Chock: Three (3) minutes.

Mr. Heacock: Is my three (3) minutes *pau*?

Councilmember Chock: Aye.

Mr. Heacock: Can I just make one (1) other comment?

Councilmember Chock: Sure.

Mr. Heacock: I have mentioned this to my colleague Steve Anthony who has left, I applaud the Council for addressing this issue and I work closely with you USGS. The information they generate we all badly need, but in their modeling of the Līhu'e basin, it is not paginated but the page that says, "Effects of pumping additional one point two million (1,200,000) gallons per day from Līhu'e, they did not address Puali Stream, Papakolea Stream, and technically I know why they did not address Papalīnāhoa because it is gone. It no longer flows. This is a stream cited in Cox's book 1960 Groundwater and Geology of Kaua'i where he talks about the perennial stream and all the petroglyphs down by the waterfall which there is not any waterfall anymore. There was before Ulu Ko, is that this subdivision there and that great big green water tank that sits across on Nāwiliwili Road across from where you come down from Kaua'i High School, whatever well feeds that dried that stream up one hundred percent (100%). That is not modeling, go and look, there are no more water there.

Councilmember Chock: Thank you. You have a question.

Councilmember Yukimura: I know you as a really skill and productive farmer in this watershed area; are you getting enough water?

Mr. Heacock: It all depends. I have had times in the past where I had to call Mike Tresler on his cell phone and say, "Mike, the stream is dry. What happened?" Or it turns brown on a beautiful crystal clear day where you can see not a drop of rainfall on the island. I know and we all know that it is not Mike's fault but these systems were designed, they are very complex irrigation systems, they can bring water from the south fork of the Wailua River and put it in Nāwiliwili Stream or put it in Puali Stream, dump it in the Papakolea that goes into the Wild

Life Refuge. It is mindboggling how they can move water around. Now, he did tell me, "Don, we will be done in a couple of days, we are working on something." He did not tell me what the something was and the water came back. I do know if you look at the old pictures of Niualu which Puali Stream feeds that are in the Kaua'i Museum, it fed almost sixty (60) acres of taro, that is almost what is growing in Hanalei today and we once had eighteen thousand (18,000) of acres of taro. We really have to get back to looking holistically about balancing domestic potable water with stream flows on a watershed by watershed basis, really by restoring our watershed. When we do that, we are going to see not only environmental profits and cultural profits, we are going to see economic profits. All we have to do is look at our Hawaiian brothers and sisters that fed a hundred fifty thousand (150,000) people at one time.

Councilmember Yukimura: Thank you.

Mr. Heacock: You are welcome.

Councilmember Chock: Next speaker.

HOPE KALLAI: *Aloha.* I wanted to thank everybody for being here and hearing this again. My questions are really for the USGS guys and they just split. I do have a PowerPoint that I am going to send to them as a .PDF and I want to provide it to you also, but my question is really about the disconnect between the science and the permitting. We have Kōloa volcanic series that is all over the island and my particular question is about the Kīlauea area. There are three (3) Kōloa volcanic vents – the three (3) sisters. If you are on the highway in the Kīlauea area looking *mauka*, first you see Kaumoku and then Kaloko, and then Kalauaa which is a half crater. All those are Kōloa volcanic series that were used during plantation era just like Lihū'e, same scenario. The plantation has changed, the ditch system and the reservoir has been broken and we are unique because we have no County potable water so we are punching wells right and left. Thirty (30) to forty (40) wells right in the area and we do not know what is going on. It is all agriculture land. You have to grow to be able to get farm dwelling unit agreement to build a house there and there is no water. We are in a serious situation in other parts, I do not want to jump on Auntie Debbie's dime but the Kōloa volcanic series unique hydrogeology extends throughout this island we better look at it before we are ten (10) years down the line. For our Deputy County Attorney, I believe in home rule and taking back our water but we also have put in stream diversion complaints over twelve (12) years ago to CWRM about unpermitted ditch diversions from the Moloka'a State Forestry Reserve and the water is still being diverted today from an area that has no County potable water. Maybe if we have one of these workshops again, we can invite CWRM to the table, it would be a really good thing to have them here. I do not know if there is ever a point that the County can consider managing surface water in addition to groundwater. It would be rewriting the whole Water Department mandate but something is not happening right. There is a huge disconnect here between science and permitting and what is going on here. Thank you for your time and considering this after hours.

Councilmember Chock: We have a question.

Councilmember Bynum: Just a couple of comments, CWRM was invited to participate in this and they are just not available because of the lack of staff, is what I was told. Twelve (12) years ago, we met with CWRM and twelve (12) years ago they did not have the staff to do, monitor and flow stream standards like

they are supposed to and they still do not. That is part of the concern, Hope, that some of the criticism is like, "Why do you want to do groundwater management when you are also critical of the state agencies that are under staffed?" I do not have an answer for you on their other responsibilities but I have an answer for this one and it is because of the Hawai'i State Supreme Court. This is an area where CWRM has to step up to the plate if this happens because it is being driven from literally the very top. This is not being driver by Councilmembers or State agencies or our Governor even, or the Legislature, it is being pretty much driven by the Supreme Court.

Ms. Kallai:

Thank you.

Councilmember Chock:

Next speaker please.

TIM KALLAI: Thank you so much, Council, I will be very short and brief. Ditto for what Hope had said. Of course you are focusing on the Puna district, we have more than our share of issues as well too in the Koolau district. With this as well we can see that water is a highly controversial, contested, and complicated issue. We are just scratching the surface. I want to applaud you at the County Council for opening the door just for the mere fact that we are looking at this in a very critical eye because it is going to be our future, the future of this island of Kaua'i. I want to thank you for doing that. I thank the Department of Water for coming and participating. I really would have appreciated, well before I do that...I want to thank both Dr. Sproat and Dr. Asquith for their input and for really pushing this forward too. I really wished that there could have been a representative from CWRM because they are a vital piece in this. They hold the upper hand with a lot of the issues that we are faced with and confronting with enforcement being one of the first and foremost. When we look at these issues, how they permit, who they give it to, where does it go, and how is it allocated – our public resources and trust. But beyond that, I am not going to say much except thank you to the upmost for starting this and for entertaining this and may we move forward with this as well. Thank you.

JOHN WEHRHEIM: We heard a lot about superior water rights today from several of the parties. As I understand those are traditional *kuleana* water rights. For decades now, the Planning Department has been relocating *kuleana* and that is because so many *kuleana* are located deep in valleys where there are no road or utility accesses. So in order for these *kuleana*'s to be usable to their owners, the Planning Department has allowed them to relocate them where there are utilities: water, utility, and road access. My question would be maybe to Kapua as well as the Attorney's here at Council, what happens to the water rights because these lands are not moving. They are not picking up these *loi* and putting them next to a road and do these water rights which are supposed to be inalienable, I mean, this is right from the 1839 Constitution through the Mahele and just about every case that has been brought out on, *kuleana* water rights claims that these are superior rights. Do these rights still go with those *loi*, with the land, or do they go with the *kuleana* where it is now a lot of record and cannot be used? That is my question.

Councilmember Chock: Good question. Anyone else? I think that was the last speaker. Would anyone from the public like to speak on this item? Seeing none, Members, we have come to our end.

The meeting was called back to order, and proceeded as follows:

Councilmember Chock: Discussion?

Councilmember Bynum: I want to thank Councilmember Hooser, who is the Chair of this Committee for having the wisdom to schedule these workshops. I would like to thank Councilmember Chock who is very knowledgeable about these issues and Chair the meeting. I want to thank Kapua, obviously Adam, and the Water Department. This is a dialogue that we wanted to have on a process issue because it is very serious concerns about how we move forward and there is some disconnects between our hopes and dreams for our island and what is technically and legally appropriate and correct. As Mauna Kea said both times he came here, "These are big issues and very complex," but it is the dialogue and the journey that never begins that takes the longest to get complete. I am glad that we started the dialogue. I think we could have done it sooner and I also wanted to acknowledge Debbie Jackson and the good energy she is putting forward on behalf of our community. As she mentioned this is not a self-interest thing about her *kuleana* but about an issue that she has the courage to bring forward to our community. She has been very patient and appropriate and I very much admire that. Thank you.

Councilmember Chock: Anyone else like to comment on this? Go ahead.

Councilmember Yukimura: This has been a fascinating learning experience and I wanted to thank all who have helped this body learn more from the original Debbie Jackson who initiated this and also to Dr. Asquith and Professor Sproat, and Professor Sproat's resource team of student lawyers. I also want to thank the Water Department and USGS for their input. It is obviously a very complex issue and a very important issue that is effecting all of the areas that we are concerned about from domestic water and affordable housing to *kuleana* and agricultural, customary rights. Thank you all for sharing with us and for members of the public who have come. Thank you to Councilmembers who have initiated this. I would like to see some quantification of the need so that if there is an easy and fast way to address that and maybe there is not, maybe that has already been tried, at least for the individuals involved the faster we can get some remedy the better. I would like to see a water plan that is really expansive in its approach such that it addresses the interconnections of surface and groundwater and leads us to a good path of how we are going to fairly address these various community means. To me that planning process would be the best way to start but lacking that I can see some of the benefits of a designated water plan. My highest hope is to see all these various parties with all the different perspectives and data coming together and seeing if we can work together.

Councilmember Chock: Councilmember Hooser.

Councilmember Hooser: Thank you, Vice Chair Chock, for leading us through this process, and Councilmember Bynum gave me credit for originating this, but he really is the person who started the discussion with me and deserves the lion's share of the credit for this very important discussion. I thank him for that. It is a really good two (2) meetings. I have learned a tremendous amount about water and the situation here on Kaua'i and it is clear to me that we are different, the geology is different and our problems and challenges are different from a lot of other places. I think a common truth was that our streams and our water systems in this particular area of the island certainly are at risk if we are not very careful about the management. I want to thank the community for raising this issue and

acknowledging that it is not about them, not about their particular situation, but for future generations. As much as I share the idea of solving their problems, this is much bigger than that. It takes a certain amount of bravery to stick your head up and make these statements and come forward and I applaud those who have done that today. There is still a lot of work to do. There will not be ever enough data. We could do study after study and then we will end up saying, "Well, we can do another study," and it will end up none-conclusive, it could say this or that, and at some point those policy decisions have to be made. I do not think we can just rely on one report after another. There are certainly enough sufficient data right now to raise red flags and to cause, I think, this body to continue the discussion at the minimum, if not, take some action. That is all I wanted to say. Thank you all very much.

Councilmember Chock: Thank you all for being here. I think the take away for me is that I have always said that everything is connected. What happens in one place affects another and we need to take that into consideration. As we talk about south Puna, it just makes me think about the whole island and the need as we move forward, and how it is that we plan for that. I am really excited about the kind of work that our Department of Water is taking into consideration. I am hoping that we include all stakeholders in that process so that we can have that big picture broad perspective as we move forward and the studies that USGS intend to help us with in order to get to the outcomes that we want. Last but not least the potential for designation, whether it is where we need to be now, but I would love to hear more about that from CWRM. I do have some fears about handing over more processes that we are not real clear about, but I understand where it is being pushed from and so *mahalo* everyone for being here. I think this is the beginning. We will continue and see you folks soon. *Aloha*.

ADJOURNMENT:

Councilmember Yukimura moved to adjourn the November 10, 2014 Special Economic Development (Sustainability / Agriculture / Food / Energy) & Intergovernmental Relations Committee Meeting, Water Workshop, seconded by Councilmember Hooser, and carried by a vote of 3:0:2 (*Councilmember Kagawa and Councilmember Rapozo was excused*).

There being no further business, the meeting was adjourned at 4:29 p.m.

Respectfully submitted,



Darrellyne M. Caldeira  
Council Services Assistant II

APPROVED at the Committee Meeting held on January 7, 2015:



KIPUKAI KUALI'I  
Chair, EDIR Committee